BEFORE THE

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

PUBLIC UTILITIES COMMISSION

| | | |
|---|---|---|
| IN RE: REVIEW OF AMENDED POWER PURCHASE AGREEMENT BETWEEN NARRAGANSETT ELECTRIC COMPANY d/b/a NATIONAL GRID AND DEEPWATER WIND BLOCK ISLAND, LLC PURSUANT TO R.I.G.L. § 39-26.1-7 | : | Docket No. 4185 |

Direct Testimony of

Shigeru Osada

On Behalf of

Toray Plastics (America), Inc.

July 2010

## INTRODUCTION

I greatly appreciate your very clear decision in Docket 4111, made on March 30th 2010. However, it is very unfortunate to come back again on the same matter. This process in my opinion is abnormal and could set a negative precedent for Rhode Island if this PPA is now approved contrary to your previous, well reasoned decision.

**Q. Please identify yourself.**

A. My name is Shigeru Osada. I am Senior Vice President of Engineering and Maintenance of Toray Plastics (America), Inc. (TPA). I am a member of the Board of TPA. TPA is located at 50 Belver Avenue, North Kingstown, RI 02852, which is also called Quonset Point Business Park.

**Q. Please describe Toray Plastics (America), Inc.**

A. TPA is 100% subsidized by Toray Industries, Inc. (Toray). Our company profile is shown on Exhibit 1. Toray is a world wide Chemical Plastics and Synthetic Fiber (including carbon fiber) manufacturer. Our sales volume is about $16 billion. We have 224 subsidiary companies in 19 countries in the word. Total employment is about 35,000 in the world. In Rhode Island we employ about 600 people.

Toray has seven business divisions as follows:

- Fibers and Textiles – 38%
- Plastics and Chemicals – 27%
- IT-Related Products – 16%

- Carbon fiber/Composite – 5%
- Housing and Engineering – 10%
- Pharmaceutical and Medical – 4% (% is based on sales amount).

TPA belongs to the Plastics and Chemical division. Its main products are very thin (4.5 micron – 50 micron) high technology Polyester and Polypropylene film. Toray's Polyester film business is number one in the world. The carbon fiber for the new Boeing Dream Liner 787 is solely supplied by Toray, and Toray is number one in the world as a carbon fiber manufacturer. We have carbon fiber plants in Alabama, Washington, Japan, and France.

TPA is located in Quonset Point Business Park and has invested $750 million in Rhode Island since 1985 when TPA established its film manufacturing base in Rhode Island. Also, in 2009, $76 million was paid in Rhode Island, including payroll, state taxes and purchasing.

## A. QUALIFICATIONS

**Q. What is your work background?**

A. I entered Toray Industries, Inc. in 1977. My background is Engineering.

I designed and managed many expansion and construction projects, including establishing a brand new joint venture manufacturing company Toray-DuPont for Polyimide film, which is used in flexible print circuits for many electronics devices, including computers. I managed five major expansion construction projects for Polyester

film and Polyimide film manufacturing plants in nine years. The investment was $230MM, which includes utility system installation.

After my assignment to TPA, I became responsible for all Engineering and Maintenance for the $750 million asset, including an expansion project, modification of the film line, maintenance improvements, and many cost savings projects. Utility management is also my responsibility. I manage the entire utility system at TPA. I have instituted more than $10 million in energy saving projects at TPA. I also led and managed the natural gas sourced heat and power combined Co-Generation plant construction, which now produces about 50 million kwh per year. Purchasing long term electricity and natural gas from NYMEX was my direct responsibility. I also led the direct electricity purchasing program from ISO-NE.

TPA is an active member of TEC-RI and I have been a TEC-RI Board Member since 2002. I am now assigned to the research committee for the selection of a new Executive Director for TEC-RI because John Farley has recently resigned.

**Q. What is your educational background?**

A. I have attached my resume as Exhibit 2. I graduated from Tohoku University in Japan in 1975 with a Bachelor's Degree in Mechanical Engineering. I received my Master's Degree in Mechanical Engineering from Tohoku University in 1977.

## B. PURPOSE

**Q. What is the purpose of this testimony?**

A. The purpose is to analyze the amended Purchase Power Agreement between National Grid and Deepwater Wind (PPA) under the terms of the amended statute. I feel that the PPA is totally unfair. It forces 480,000 ratepayers to buy high cost electricity for 20 years, charging an additional $390 million (excluding the underwater cable fee) above market cost based on National Grid's own estimation (Exhibit 3). This new law appears to have been enacted to subsidize one company (Deepwater Wind) in an attempt to guarantee their revenue for 20 years simply because their product is "renewable" or "green."

TPA would like to expand its operations at Quonset and increase its work force. This cannot be done if the cost of electricity goes higher as Deepwater Wind would like. Rhode Island's economic recovery and future development will be negatively impacted by this PPA.

In a free market competitive economy laws should not attempt to specifically guarantee one company's revenue and profits for 20 years.

This PPA is not good for any ratepayers, but it is especially bad for businesses in Rhode Island. The $390 million negative impact will certainly lead to weakening businesses in Rhode Island economically.

The purpose of this testimony is to encourage this Commission to reject this PPA by demonstrating our serious concerns and that the statutory requirements have not been met.

## C. EXECUTIVE SUMMARY OF THIS TESTIMONY

**Q. Please provide a summary of the issues addressed in your testimony.**

A. In my testimony, I will address the following to focus on various aspects of the commercial unreasonableness of the PPA:

1. Price evaluation
2. Price discussion with electricity deregulation
3. Price sustainability as a main advantage of renewable energy
4. Environmental benefit related to incurred cost
5. Economic impact on Rhode Island businesses
6. Economic impact of the large scale wind project

**Q. Please describe your price evaluation.**

A. The starting price of 24.4c/kwh is extremely high as the PUC already pointed out through its 7-month evaluation in Docket 4111.

The price to be compared with should not be Standard Offer Service, but should be the ISO-NE wholesale price, because this is the available price in the competitive market, mixing all kinds of power generation. It comes from a clearing price based on competition (i.e., bids).

TPA was involved in direct purchasing from ISO-NE in 2008, and we were tracking the day ahead price every day. Exhibit 4 is the price trend for 2008 which was the worst case in history. Crude oil prices went up to their historical highest point of $147/barrel. However, even at this oil price peak the average electricity price ended at 7.9c/kwh.

The average ISO-NE price for 2009 was 4.1c/kwh (Exhibit 5), and 2010 YTD through June was 4.6c/kwh (Exhibit 6). I have also shown the 10 year trend of ISO –NE prices in Exhibit 7.

These prices are before adding RECs. However, it is very obvious that the PPA price is extremely high. Moreover, 3.5% solid escalation, without regard to the actual CPI, is extremely abnormal and totally ignores market competition mechanisms and benefits one company as a monopoly.

Another price which the 24.4 c/kwh can be compared with is the price from a report by the US Department of Energy (Exhibit 8). This report was prepared by the National Renewable Energy Laboratory. This report is forecasting 5c/kwh in 2014 for offshore wind power. I assume that this is not including RECs. If we added 5c/kwh for RECs the price is still only 10c/kwh in total in 2014.

Another price which the 24.4 c/kwh can be compared with is the Rhode Island Offshore Wind Stakeholders Final Report. The State of Rhode Island prepared a detailed study of

offshore wind power in 2007. The final report was issued by the State Government as the Rhode Island Offshore Wind Stakeholders Final Report in February 2008 (Exhibit 9).

This report concluded that the forecasted cost of wind power would be 9.4c/kwh to 13.7/kwh including a 20% contingency adder. This is a report from the State of Rhode Island, so this data should have some level of weight.

Another source the 24.4 c/kwh can be compared with is the Bluewater Wind project in Delaware/NJ. Their offshore wind power price is 11.71c/kwh (Exhibit 10).

As you know, at the end of the Docket 4111 discussion, there was a very good question posed by Commission Chairman Germani. Here is the quote from the *Providence Journal*:

> "After the public comment period, the commission questioned Cliff Hamal, an energy expert hired by National Grid who analyzed prices for power from offshore wind farms installed in Europe and proposals in Canada and the U.S.
>
> Commission Chairman Elia Germani asked Hamal if he knew of any offshore wind contracts with prices higher than 24.4 cents per kilowatt hour.
>
> No, I don't, said Hamal."

This above information is helpful to evaluate the 24.4c/kwh price, which I believe, when placed in context, is not commercially reasonable.

**Q. Why are you referring to deregulation regarding price evaluation?**

A. The Rhode Island electricity system went into a new scheme after deregulation of electricity was enacted in 1998. The concept of deregulation was to take the energy portion out of the total electricity price for rate payers and make it competitive, while the distribution system was kept by Narragansett Electric as a monopoly. After this scheme, power generation went into the competitive market. ISO-NE is managing market price, demand and supply every single moment.

The bottom line of this deregulation is that ratepayers, especially commercial and industrial, can choose lower energy prices from the competitive market.

In 1999, TPA entered into a contract with a competitive power marketer to seek lower prices after deregulation. However, this PPA is giving a monopoly situation to Deepwater Wind to sell the power exclusively to National Grid, which has the monopoly for distribution, and can force the above market cost to be transferred to all ratepayers through distribution rates, which I believe is totally against the concept of deregulation. The concept was to encourage free competition for power generation.

There is no competition through the market mechanism in this PPA. The kwh generated by this demonstration project is just 1.3% of the whole State's usage (according to Deepwater Wind). However, the impact on all ratepayers is huge at $390MM.

**In fact, the cost impact is $287,000 for the first year alone for just one company—TPA.**

After the big project is done, the competiveness of power generation will be essentially lost, all in the name of "renewable" or "green" energy.

From the view point of competitiveness, this price is not commercially reasonable or practical and is against all basic concepts of a free, competitive market economy. Subsidizing one company by forcing all people to buy high priced electricity is what this PPA really does.

**Q. Why are you referring to price sustainability?**

A. One of the main goals of renewable power generation is price sustainability. This should be the main benefit from renewable power generation. Renewable power generation should eliminate some of the volatility caused by fossil fuel source prices.

**Q. But is such sustainability achieved by this PPA?**

A. No. The initial price of 24.4c/kwh is guaranteed to increase up to 46.9c/kwh after 20 years due to the 3.5% guaranteed escalation. Of course this 24.4c/kwh could be reduced if construction costs are lower than expected. However, the law guarantees this escalation. This ignores ratepayers.

**Q. Do you think this PPA provides reasonable environmental benefits?**

A. No. This project will contribute to carbon foot print reduction a little bit. CO2 can be reduced by 59,400 t/year or 1,188,000 t for 20 years. From this limited view point, the

environmental benefit is positive. However, as you know, the cost to reduce the carbon foot print can not be ignored. The cost to reduce this amount of carbon foot print has a generally accepted price. $1.88/t was the price in RGGI (Exhibit 11). However, the cost in this case is $328/t considering only the additional cost incurred by all ratepayers. If you include the initial construction cost, the cost of CO2 reduction is $501/t, 266 times! The comparison of these two prices clearly tells us that this is an unreasonably expensive investment to reduce carbon foot print. From this environmental viewpoint, this is not commercially reasonable nor practical.

**Q. Please describe the economic impact of the PPA.**

A. This project will create 6 permanent job and $205 million of construction jobs. This is a good thing for the state economy.

However, $205 million of construction jobs by a private investor is not enough to justify such a huge financial burden to existing commercial and industrial customers.

Toray invested $750 million in Quonset Point in Rhode Island during a 25 year period, and now employs 600 people in Rhode Island. We never imposed a financial burden on any existing or potential businesses to achieve this.

We just created $750 million of construction jobs. We provided many union jobs through the construction.

This "small" demonstration project will cost TPA $287,000 in the first year alone. With 3.5% escalation, this above market cost for 20 years will be $7.2MM to $8.1MM for TPA depending on the escalation rate of the wire fee (Exhibit 12).

There is no evidence of any future job creation for the State that will justify this huge burden of $7MM to $8MM to TPA alone. And it will undermine TPA's ability to expand and create more jobs in Rhode Island.

A $390 million above market cost means that this is additional expense for all ratepayers. What do we do when expenses increase without a corresponding income increase or other benefit of any kind? All people try to reduce the expense by stopping shopping. That is what TPA would have to do. This is a huge economic negative impact for Rhode Island.

Most businesses may choose the following things when faced with a huge cost increase that carries no corresponding benefit:

1. Institute a hiring freeze when someone leaves the company. General turnover ratio can be 20%. Some people definitely will be adversely affected by a hiring freeze.
2. Institute expense cuts ("do not buy anything except toilet paper"), reduce travel costs, provide less merit pay increases, etc., in order to absorb the extra costs. This will keep people's wallets tight, reducing consumer spending in Rhode Island.

3. Businesses will have no pride in Rhode Island and will lose the confidence needed to keep their businesses in Rhode Island or to encourage new businesses to locate here. Many businesses have already left for this very reason. If the PPA is approved, the State of Rhode Island will never succeed in recruiting businesses from outside of the State due to the impact of the high price of electricity on commercial and industrial customers. This is very serious. Many businesses, including TPA, have already lost confidence in doing business in this State. They cannot afford to lose more. If TPA is faced with the high price impact of this PPA, TPA will make a decision not to execute a major expansion like an additional film manufacturing plant in this State even if the overall economic situation improves and the opportunity arises. We do not feel we have utility price sustainability in this State. This reduces our confidence in expanding business in this State. The sustainability of business conditions, including utility cost sustainability, is the very key to keeping and expanding businesses. What is next? We simply can not bear anymore.

**Q. How do you view the potential of the large scale project?**

A. We have heard that this is a "small" demonstration project before the large scale project. We are expecting a lower price for the large project, but we already know that the price of the Cape Wind project of 420MW is 20.7c/kwh with 3.5% escalation for 15 years. Using this as a guide what will the price be for Deepwater Wind's next phase of 385 MW? Using a scale factor, 20.7c/kwh *420/385 =22.5c/kwh! This is almost the same as the "small" project. We understand that Cape Wind is in more shallow water than

Deepwater Wind. Using this price, if you calculated the above market price, referring to National Grid's estimate in Docket 4111 (Exhibit 3). Above market cost for the first year alone will be $139,826,823! This is the equivalent of a 1.72c/kwh price increase (detailed calculation was shown in Exhibit 13, and this is not including the underwater cable fee). A regular house with 500 kwh usage, which National Grid is using as a bench mark, will be increased by $8.60/mo ($103.20/y). But the impact will be $1.90 MM/y for TPA for the first year! If you apply 3.5% escalation for over 20 years, this will be a $53MM impact for TPA over 20 years. Exhibit 14 shows a case study at different price variations. As you can see, the price impact is huge.

It does not take any additional words to explain how seriously this will negatively impact TPA and similar businesses.

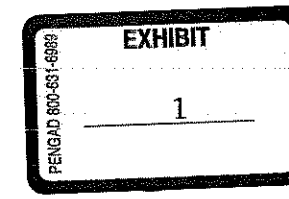
**Q. Do you think this large project will reduce prices in the future?**

A. No. Today ISO-NE capacity is in good shape (Exhibit 15). That is why the auction for forward capacity market for 2013 went down to floor price. If these type of expensive power purchase contracts are approved, above market cost will be significantly increased and we will end up as the highest cost State for electricity, and no business will seriously consider coming to Rhode Island.

CNBC ranked RI as the 49th state in a recent report and Forbes ranked RI as the 50th state last year with regard to business friendliness. We should consider this seriously if we want RI to improve.

**Q. Does this conclude your testimony?**

A. Yes.




Profile of Toray

Toray Industries,Inc

- Global company based in Tokyo
- 224 subsidiaries / 6 divisions in the world
  Fibers and Textiles 38%
  Plastics and Chemicals 27%
  IT-Related Products 16%
  Carbon fiber/ Composite 5%
  Housing and Engineering 10%
  Pharmaceutical and Medical 4%
  (% is based on sales dollar)
- Business in 19 countries in the world
- 35,000 employees in the world
- Net Sales $16.0 billion
- World leader in synthetic fibers
- World leader in carbon fiber technology
  (Supplier for Boeing 787 Dreamliner)
- World's #1 bioriented Polyester film manufacturer

Toray Plastics (America),Inc

- 100% subsidized by Toray Industries, Inc
- Belongs to Plastics and Chemical Division
- Employing 600 people in RI, 100 people in VA
- Making very thin (4.5 micron to 50 micron) high technology Polyester film and Polypropylene film for many industrial application
- Polyester film plant is located in USA (here), France,Japan,China,Korea,Malaysia
- Invested $750 million in RI since 1985
- Payment to State of Rhode Island in 2009 was $76 million for payroll and purchasing in RI

# SHIGERU OSADA

Toray Plastics (America), Inc.
50 Belver Avenue
N. Kingstown, RI 02852-7520

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1975 Tohoku University/College of Engineering
BS in Mechanical Engineering

1977 Tohoku University/College of Engineering
Masters Degree in Mechanical Engineering

1977 Entered Toray Industries, Inc
Assigned to the Engineering and Maintenance Department of the Gifu Plant, which manufactures polyester film and ultra suede

1983 Transferred and promoted to Toray Engineering Center, which handles world-wide engineering projects
Main projects worked on:
Toray DuPont joint venture regarding Polyimide film at the Kapton plant – $80MM
Gifu Polyester film manufacturing – new line $90MM
Gifu Polyester film manufacturing – new line $160 MM

1992 Assigned as Project Manager for the Toray Plastics (America), Inc. polyester film line

1993 Promoted to Director of Engineering and Maintenance
Responsible for all Engineering and Maintenance issues, including utilities Management
Construction of new two Polyester film manufacturing line $200MM
Construction of new one Polypropylene film line $50MM
Construction of new three metallized film manufacturing line $45MM
Construction of Co-Generation plant which now generates about 50 million kWh per year
Energy saving project $10MM

2003 Promoted to Vice President of Engineering and Maintenance

2008 Promoted to Senior Vice President and Member of the Board

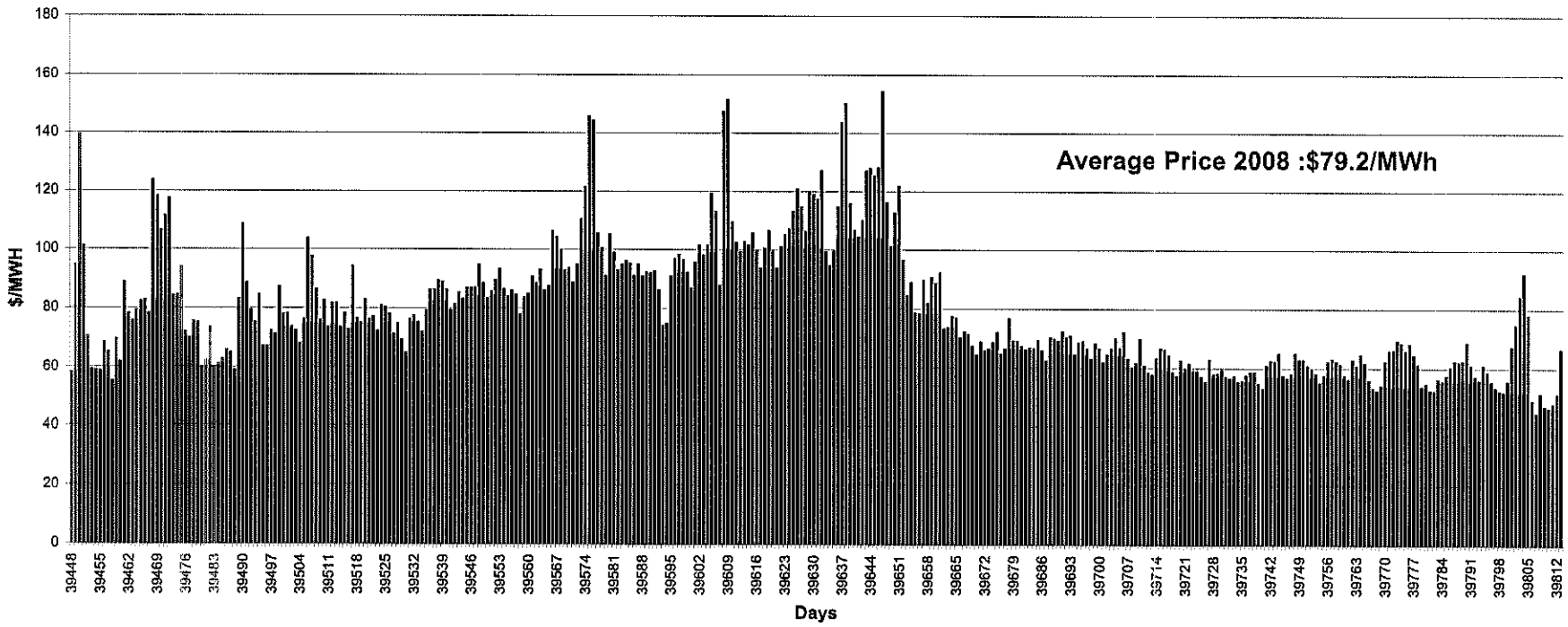
Please see the attached profile of Toray and incorporated by reference herein.

# Estimated Above Market Cost for 20-year PPA

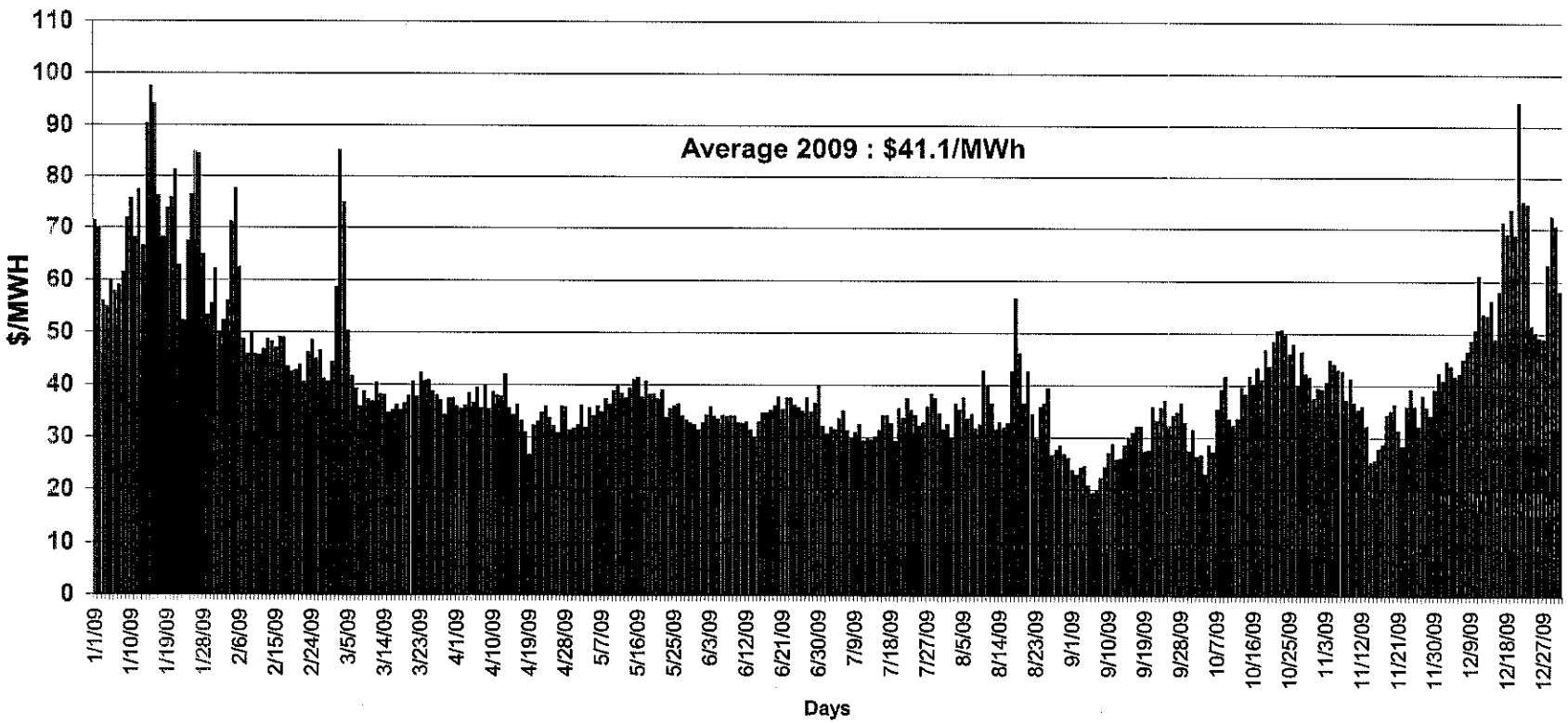
## Hypothetical Comparison with Competitive Solicitation

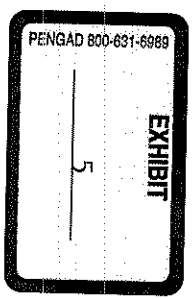
| | 8 WTG 28.8 MW | | 12/09/2009 PPA | | Competitive Solicitation | |
|---|---|---|---|---|---|---|
| | Statutory Capacity | | 11.5 MW | | 50 MW | |
| | Annual Output | | 100915 MWh | | 788400 MWh | |
| | | | Above Market Cost | | | Above Market Cost |
| | Unit Pricing | Contract Cost | ESAI 7x24 Pricing | Synapse Seasonal Pricing | Contract Cost | ESAI 7x24 Pricing |
| 2009 | $ 312.63 | | | | | |
| 2010 | | | | | | |
| 2011 | | | | | | |
| 2012 | $ 336.76 | $ 4,153,396 | $ 1,894,724 | $ 2,382,577 | | |
| 2013 | $ 344.00 | $ 24,623,340 | $ 12,977,197 | $ 12,930,641 | $ 162,367,878 | $ 66,636,128 |
| 2014 | $ 352.84 | $ 25,484,946 | $ 13,751,626 | $ 12,970,766 | $ 166,100,754 | $ 105,480,800 |
| 2015 | $ 361.38 | $ 26,375,916 | $ 13,725,001 | $ 13,521,199 | $ 206,069,290 | $ 109,296,507 |
| 2016 | $ 370.62 | $ 27,303,034 | $ 13,416,625 | $ 13,953,993 | $ 213,281,735 | $ 106,780,695 |
| 2017 | $ 379.88 | $ 28,266,534 | $ 13,620,661 | $ 13,585,589 | $ 220,746,564 | $ 106,242,695 |
| 2018 | $ 389.79 | $ 29,244,447 | $ 13,946,124 | $ 15,998,274 | $ 228,472,694 | $ 110,665,348 |
| 2019 | $ 399.84 | $ 30,269,033 | $ 14,302,534 | $ 14,962,145 | $ 236,465,239 | $ 113,398,661 |
| 2020 | $ 410.43 | $ 31,327,383 | $ 14,804,660 | $ 15,050,996 | $ 244,745,662 | $ 117,160,282 |
| 2021 | $ 421.30 | $ 32,423,841 | $ 15,576,725 | $ 17,545,645 | $ 253,311,760 | $ 121,181,455 |
| 2022 | $ 432.54 | $ 33,559,575 | $ 17,089,630 | $ 16,486,632 | $ 262,177,672 | $ 137,396,832 |
| 2023 | $ 444.18 | $ 34,733,225 | $ 15,366,944 | $ 19,539,889 | $ 271,353,890 | $ 149,093,729 |
| 2024 | $ 455.23 | $ 35,948,882 | $ 15,966,648 | $ 20,832,606 | $ 280,851,276 | $ 162,888,912 |
| 2025 | $ 469.70 | $ 37,207,133 | $ 21,768,586 | $ 22,328,570 | $ 290,684,071 | $ 176,890,232 |
| 2026 | $ 481.60 | $ 38,509,352 | $ 23,316,612 | $ 23,134,511 | $ 300,854,508 | $ 188,675,348 |
| 2027 | $ 394.86 | $ 39,857,179 | $ 24,290,747 | $ 23,951,129 | $ 311,384,830 | $ 196,671,114 |
| 2028 | $ 408.76 | $ 41,252,181 | $ 25,305,776 | $ 24,938,965 | $ 322,283,299 | $ 204,635,273 |
| 2029 | $ 423.09 | $ 42,696,007 | $ 26,376,181 | $ 25,677,636 | $ 333,563,215 | $ 213,355,394 |
| 2030 | $ 437.90 | $ 44,190,367 | $ 27,456,686 | $ 26,557,664 | $ 345,237,927 | $ 222,372,751 |
| 2031 | $ 453.22 | $ 45,737,030 | $ 28,553,036 | $ 27,480,672 | $ 357,321,255 | $ 231,766,709 |
| 2032 | $ 469.09 | $ 47,337,825 | $ 29,548,727 | $ 28,417,262 | $ 369,827,499 | $ 241,593,193 |
| Sum | | $ 760,455,011 | $ 380,459,730 | $ 392,807,313 | $ 5,440,102,376 | $ 3,126,166,960 |
| NPV @ 7% | | $ 323,300,561 | $ 173,671,636 | $ 176,217,468 | $ 2,670,070,245 | $ 1,477,454,429 |

**Day Ahead LMP Average Pricing**
**January to December 2008**



**Day Ahead LMP Average Pricing**
**January to December 2009**



**Day Ahead LMP Average Pricing**
**January 1, 2010 to June 30, 2010**

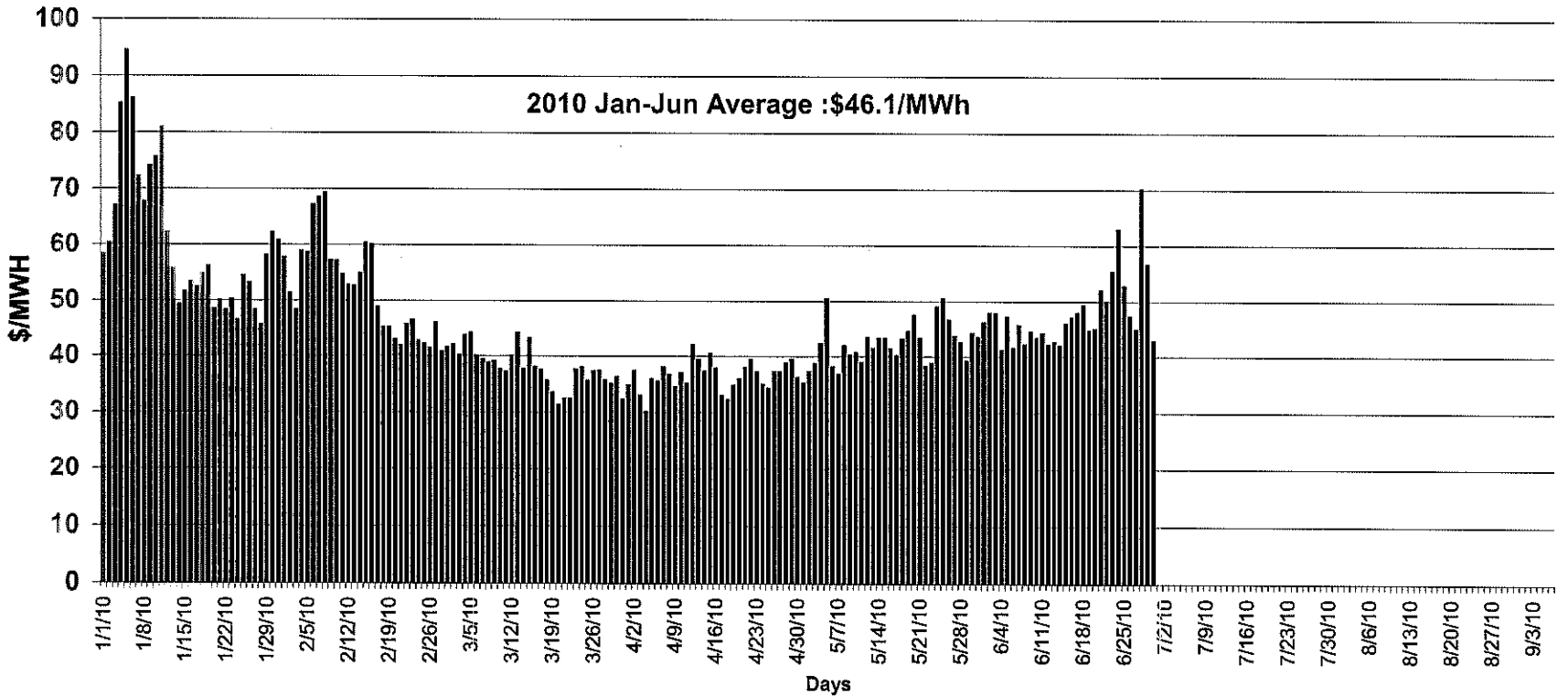



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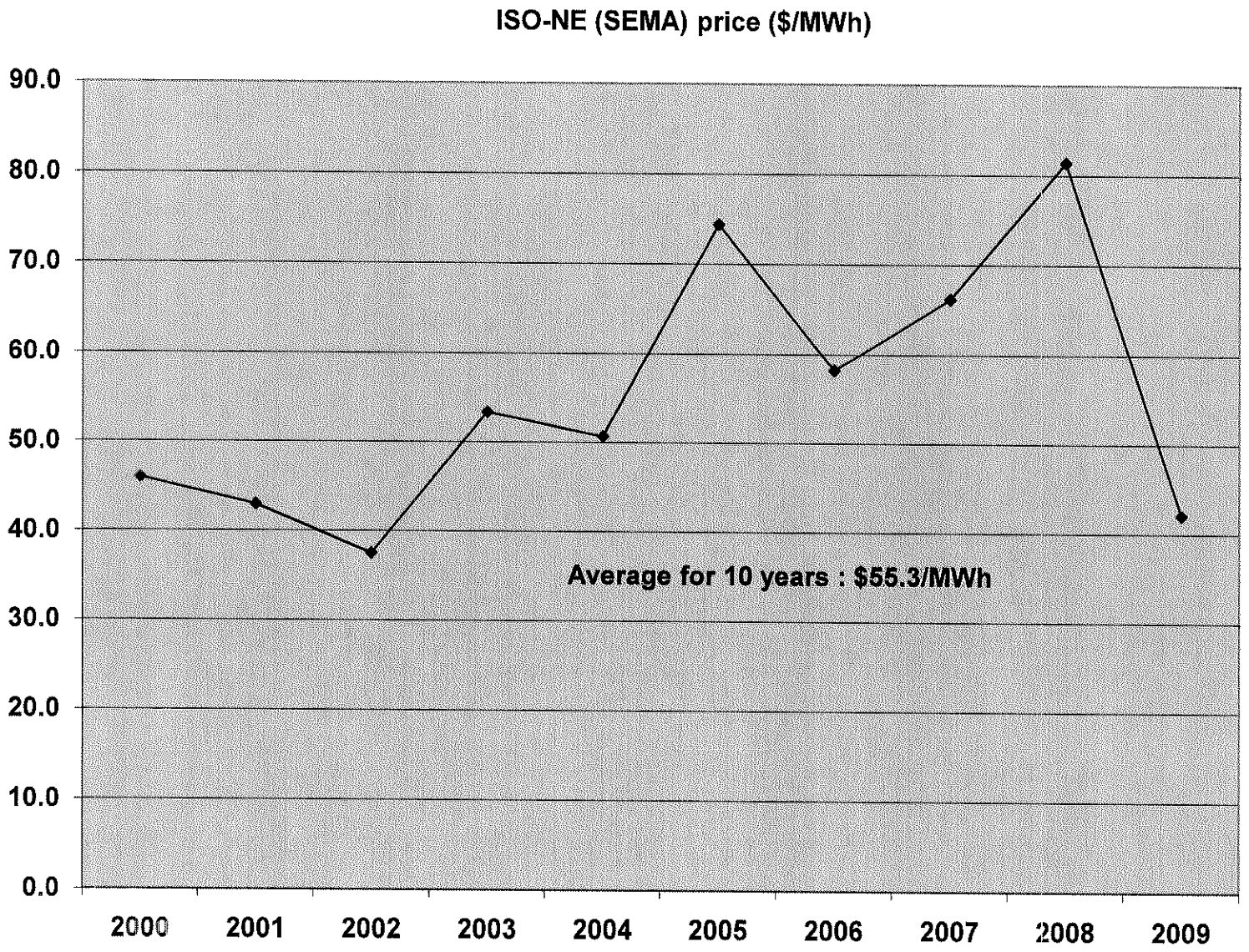
EXHIBIT 6



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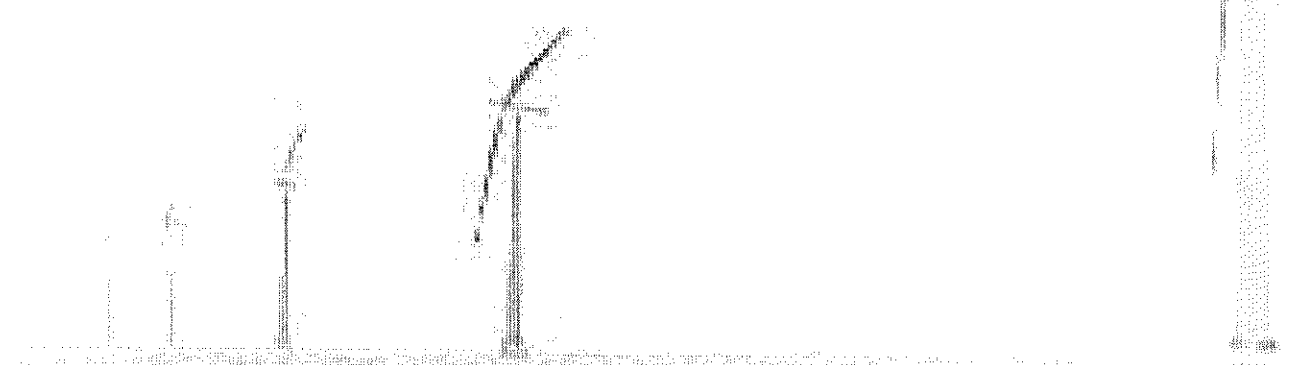
# Offshore Wind Technology Overview




**Mike Robinson**
**Walt Musial**
**National Wind Technology Center**
**National Renewable Energy Laboratory**



NREL/PR-500-40462
October 2006

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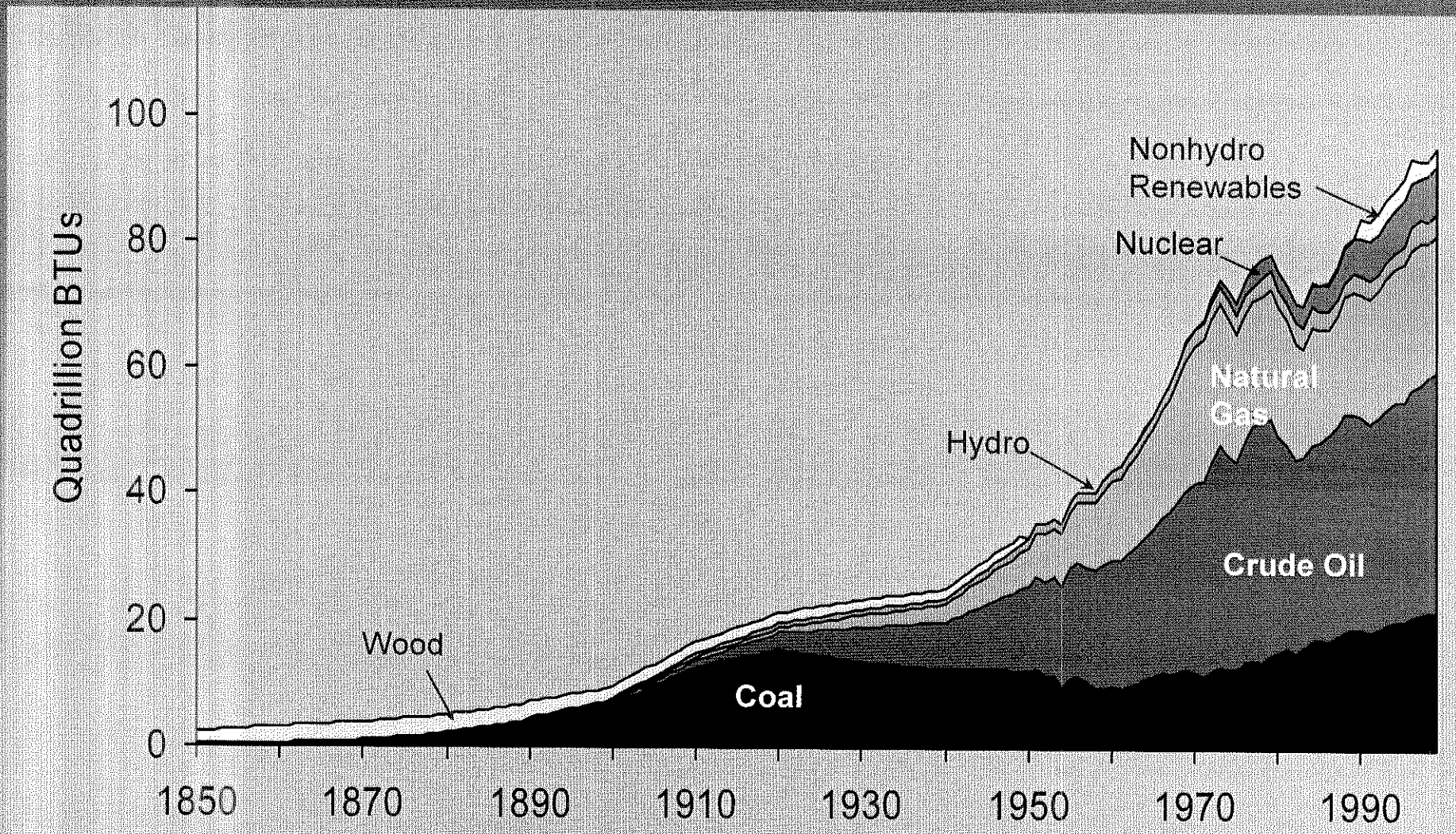
# The U.S. Energy Picture by Source - 1850-1999




Source: 1850-1949, Energy Perspectives: A Presentation of Major Energy and Energy-Related Data, U.S. Department of the Interior, 1975; 1950-1996, Annual Energy Review 1996, Table 1.3. Note: Between 1950 and 1990, there was no reporting of non-utility use of renewables. 1997-1999, Annual Energy Review 1999, Table F1b.

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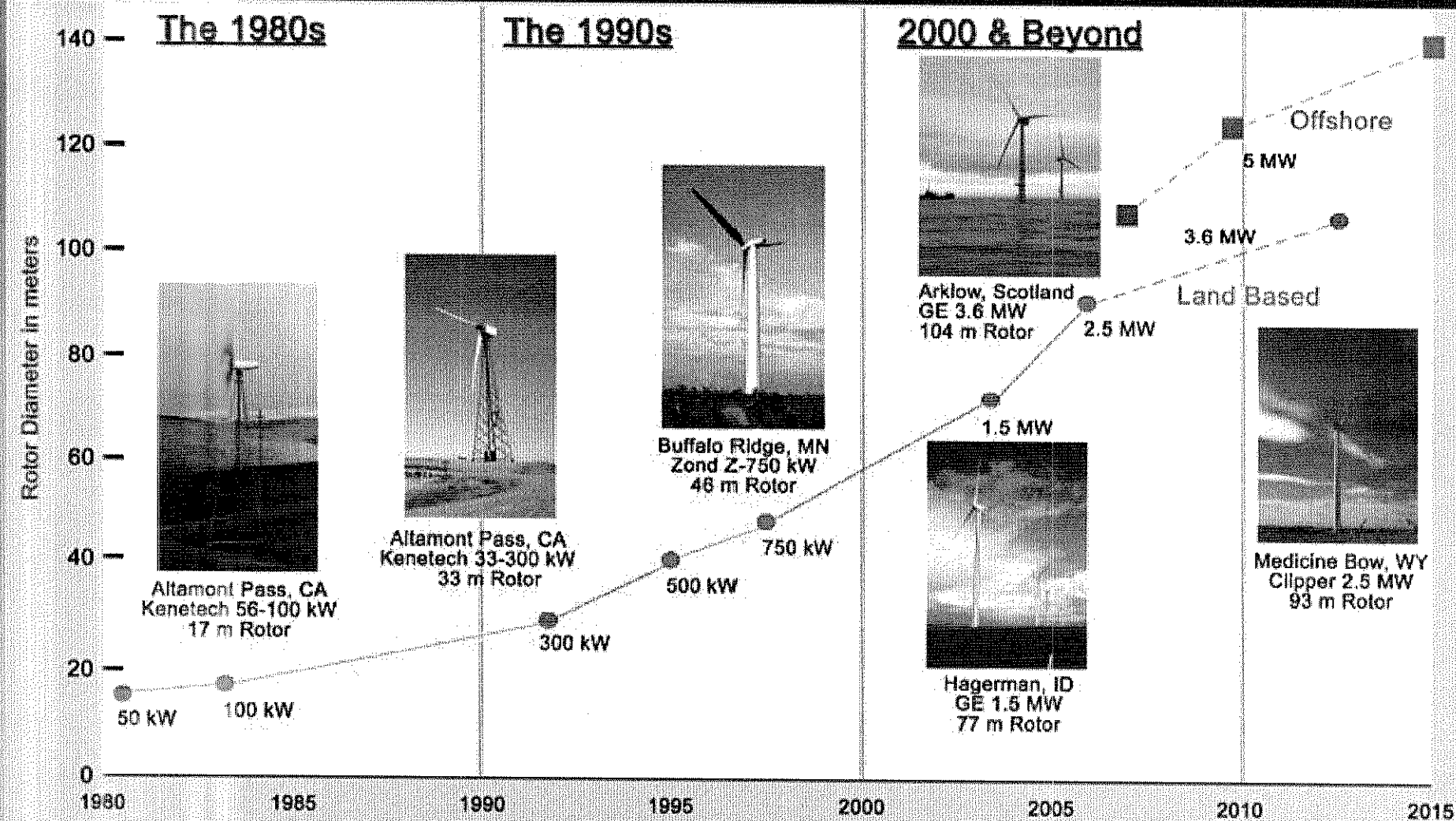
Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable

# Evolution of U.S. Commercial Wind Technology

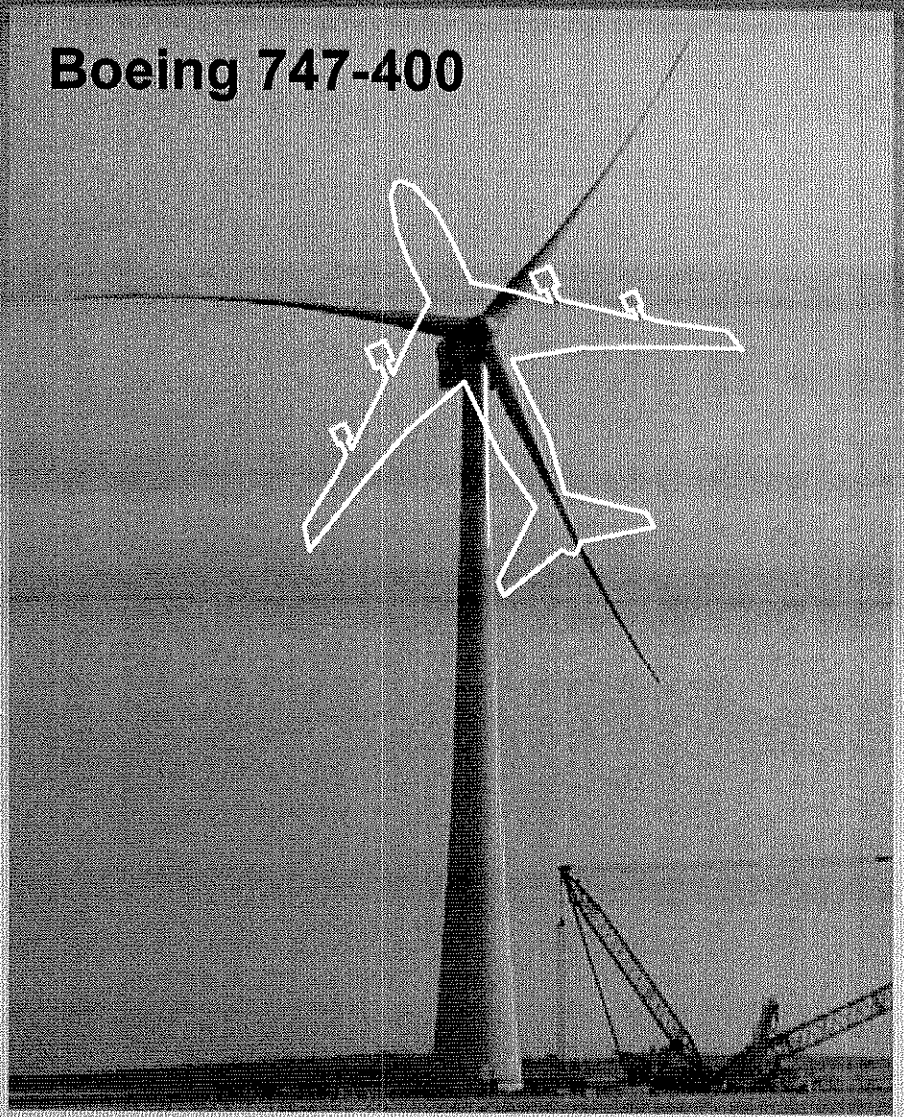
## Evolution of U.S. Commercial Wind Technology



# Offshore GE Wind Energy 3.6 MW Prototype

- Offshore GE 3.6 MW
  104 meter rotor diameter

- Offshore design requirements considered from the outset:
  - Crane system for all components
  - Simplified installation
  - Helicopter platform



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# Cost of Energy Trends

**1981: 40 cents/kWh**

**Increased Turbine Size**

**R&D Advances**

**Manufacturing Improvements**

**2006: 9.5 cents/kWh**

- **Multimegawatt Turbines**
- **High Reliability Systems**
- **Infrastructure Improvements**

**Land-based**

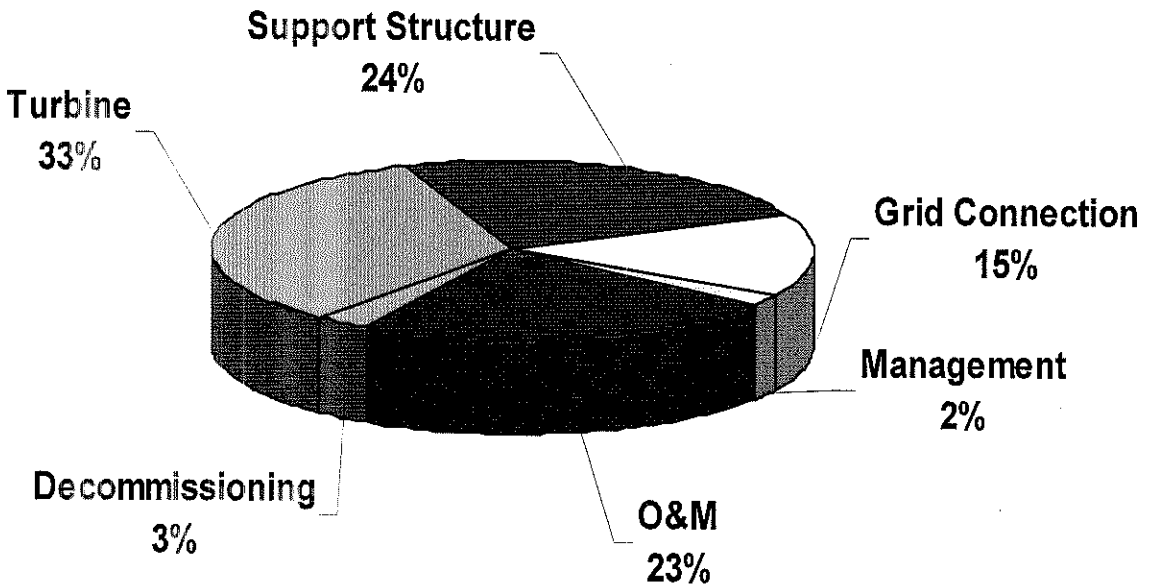
**2006: 3 - 6 cents/kWh**

**Offshore**

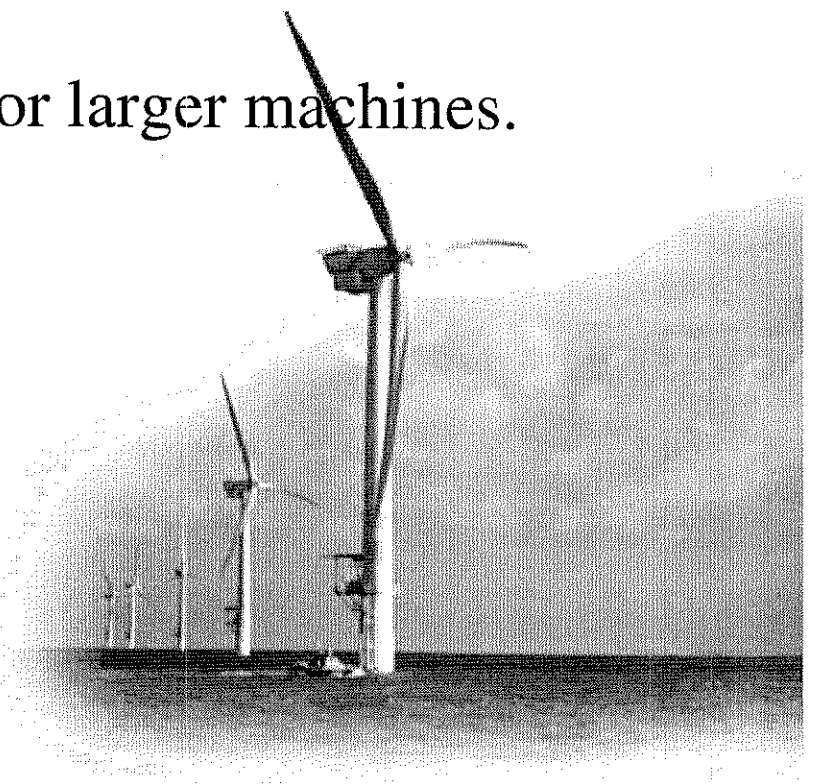
**2014: 5 cents/kWh**

# Offshore Turbine Size Drivers

- Offshore Turbines are about 1/3 of total project cost.
- Thus, as turbines grow larger:
  - Foundation costs decrease
  - Electrical infrastructure costs decrease
  - Operational expenses decrease
  - More energy is generated per area.
- Offshore infrastructure is also suited for larger machines.




***Offshore Wind - Life Cycle Cost of Energy***



GE Wind

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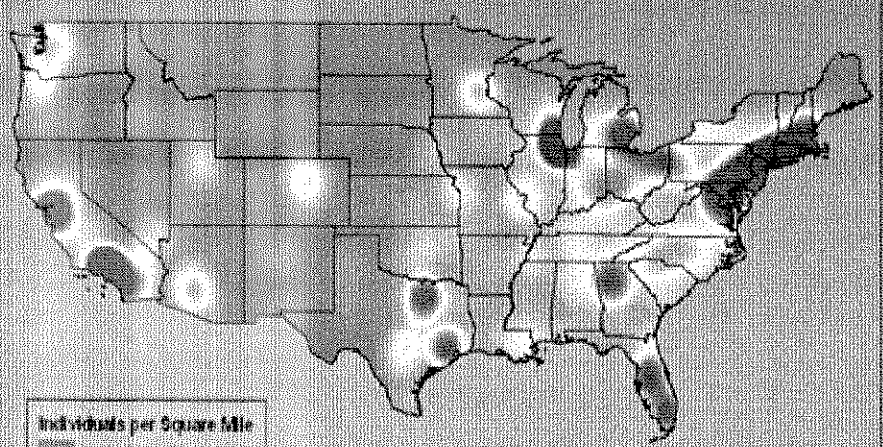
# Offshore Wind – U.S. Rationale
# Why Go Offshore?

*Windy onshore sites are not close to coastal load centers*

*The electric utility grid cannot be easily set up for interstate electric transmission*

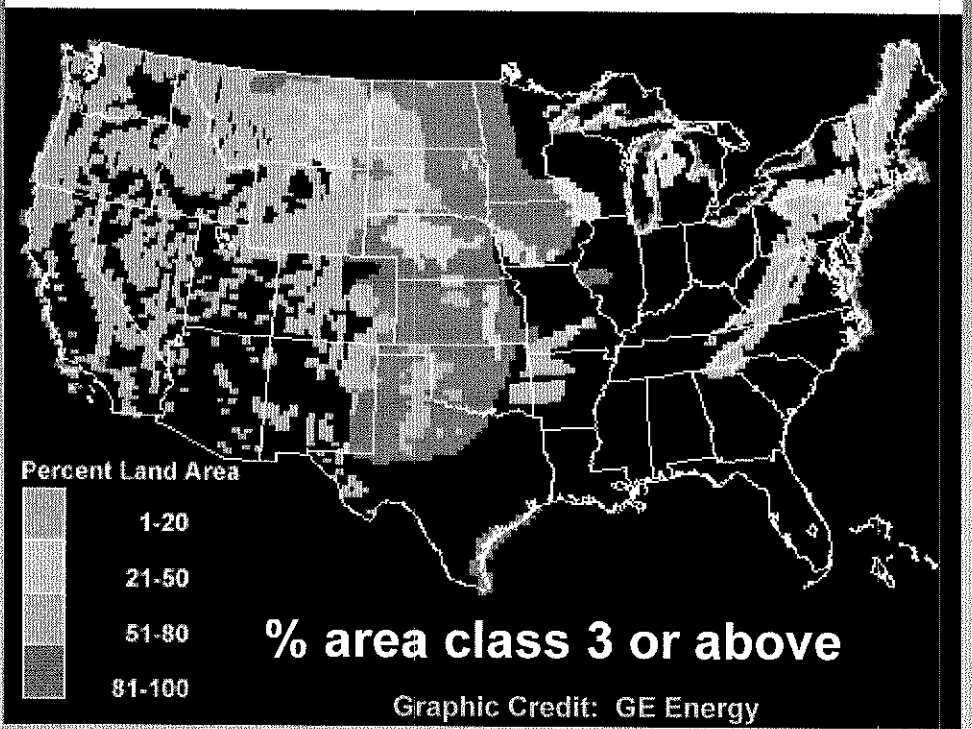
*Load centers are close to the offshore wind sites*

## US Population Concentration




Graphic Credit: Bruce Bailey AWS Truewind

## US Wind Resource




Graphic Credit: GE Energy

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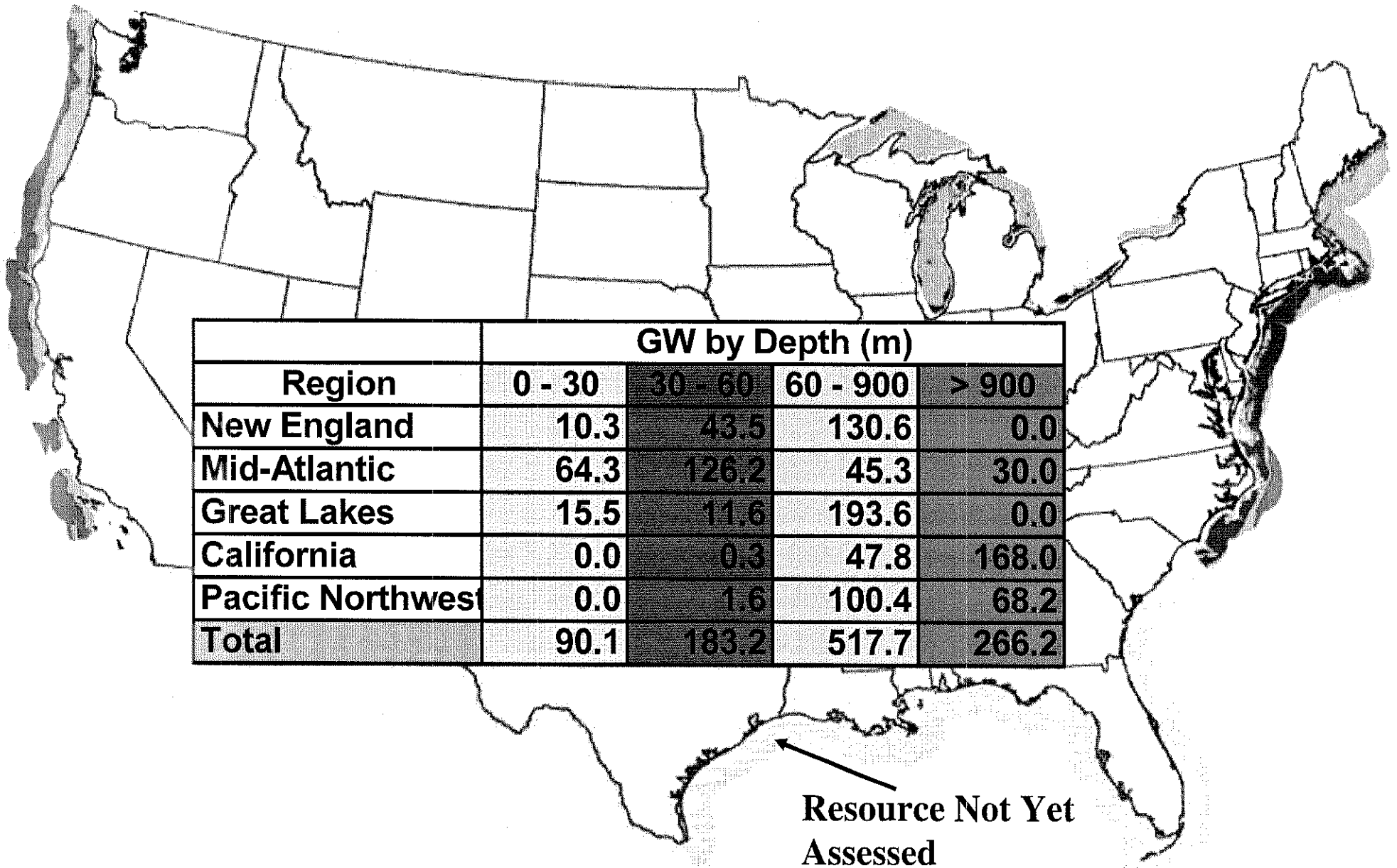
# U.S. Offshore Wind Energy Resource



| | GW by Depth (m) | | | |
|---|---|---|---|---|
| Region | 0 - 30 | 30 - 60 | 60 - 900 | > 900 |
| New England | 10.3 | 43.5 | 130.6 | 0.0 |
| Mid-Atlantic | 64.3 | 126.2 | 45.3 | 30.0 |
| Great Lakes | 15.5 | 11.6 | 193.6 | 0.0 |
| California | 0.0 | 0.3 | 47.8 | 168.0 |
| Pacific Northwest | 0.0 | 1.6 | 100.4 | 68.2 |
| Total | 90.1 | 183.2 | 517.7 | 266.2 |

Resource Not Yet Assessed

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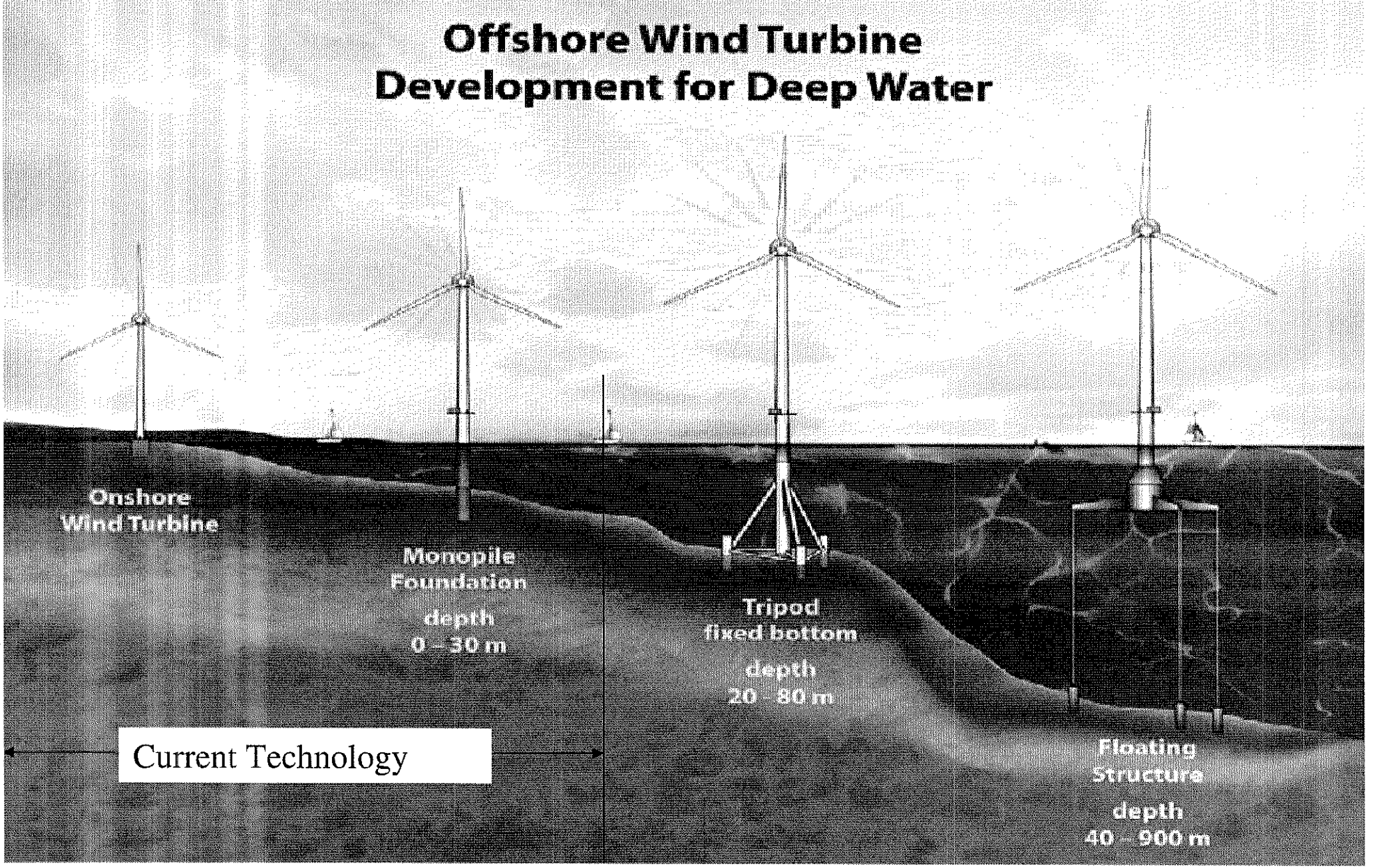
# Offshore Wind Turbine Development



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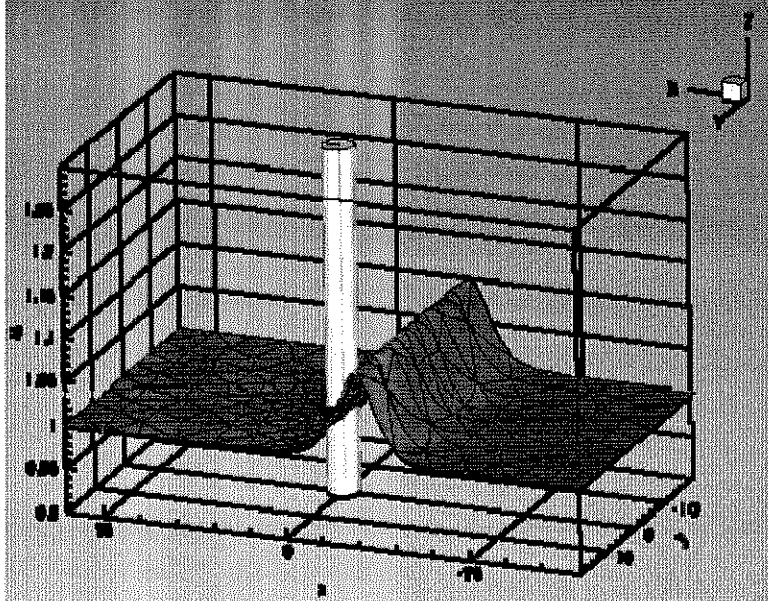
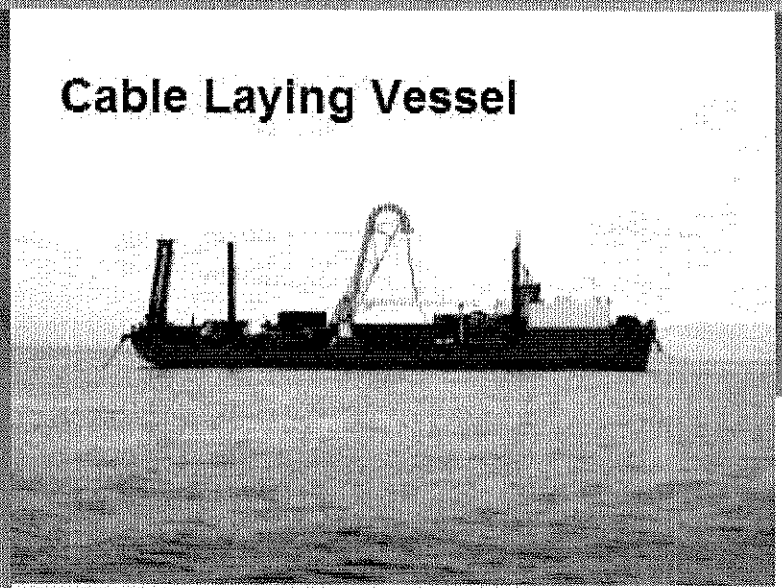
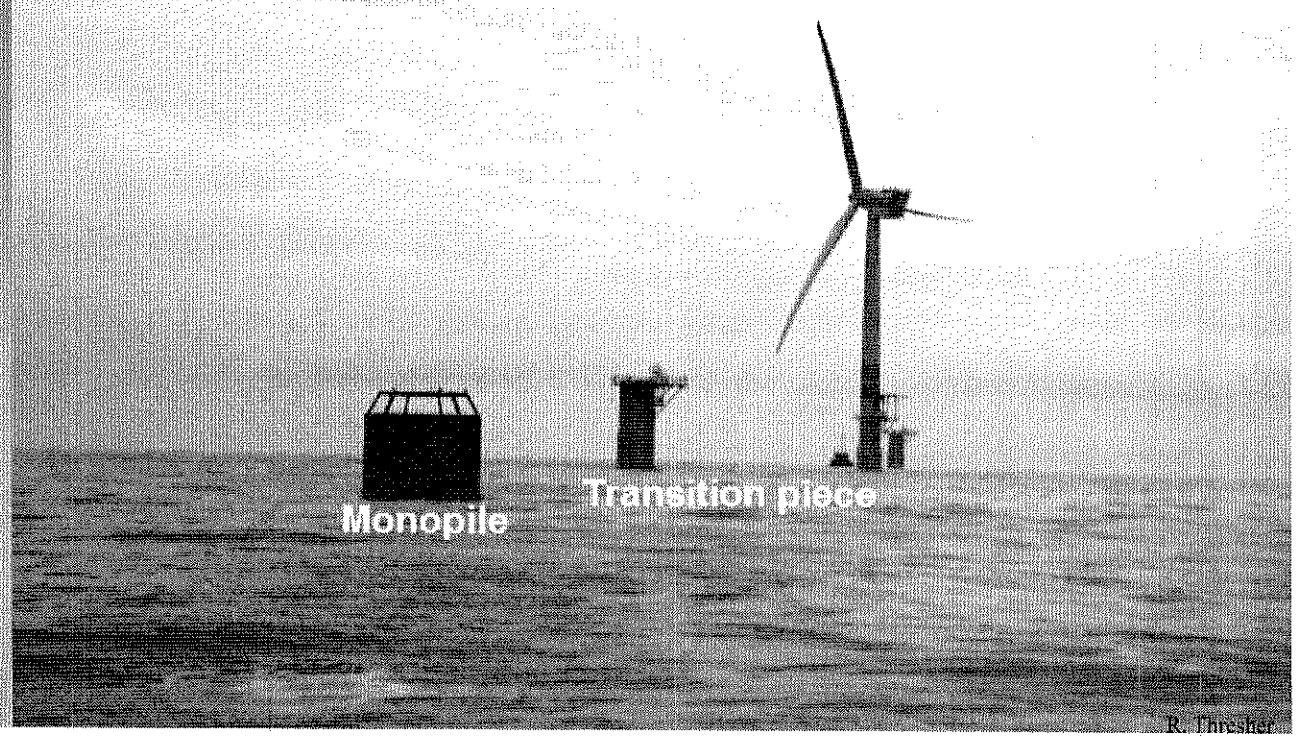
# Arklow Banks Windfarm
# The Irish Sea






R. Thresher

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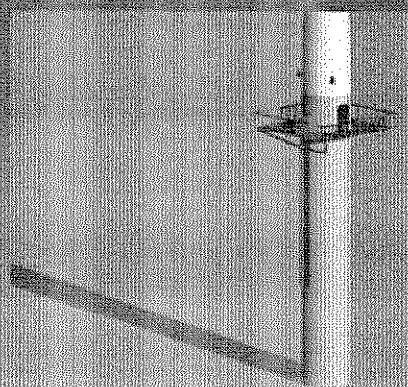
# Fixed Bottom Substructure Technology

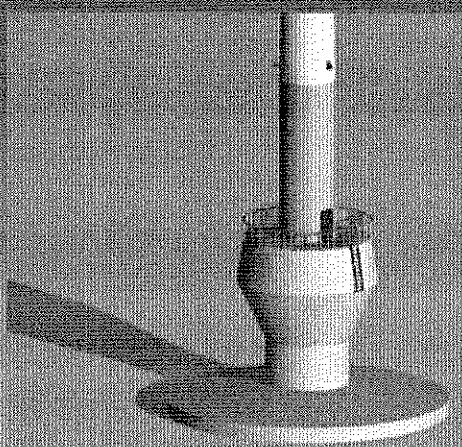
## Proven Designs

## Future



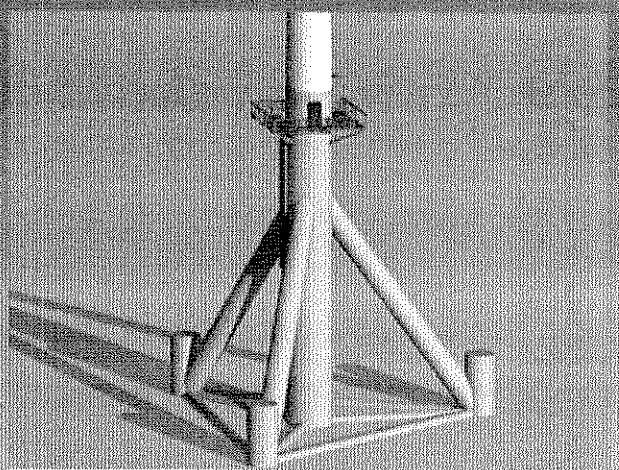
### Monopile Foundation

- Most Common Type
- Minimal Footprint
- Depth Limit 25 m
- Low stiffness



### Gravity Foundation

- Larger Footprint
- Depth Limit?
- Stiffer but heavy



### Tripod/Truss Foundation

- No wind experience
- Oil and gas to 450 m
- Larger footprint

Graphics source: http://www.offshorewindenergy.org/

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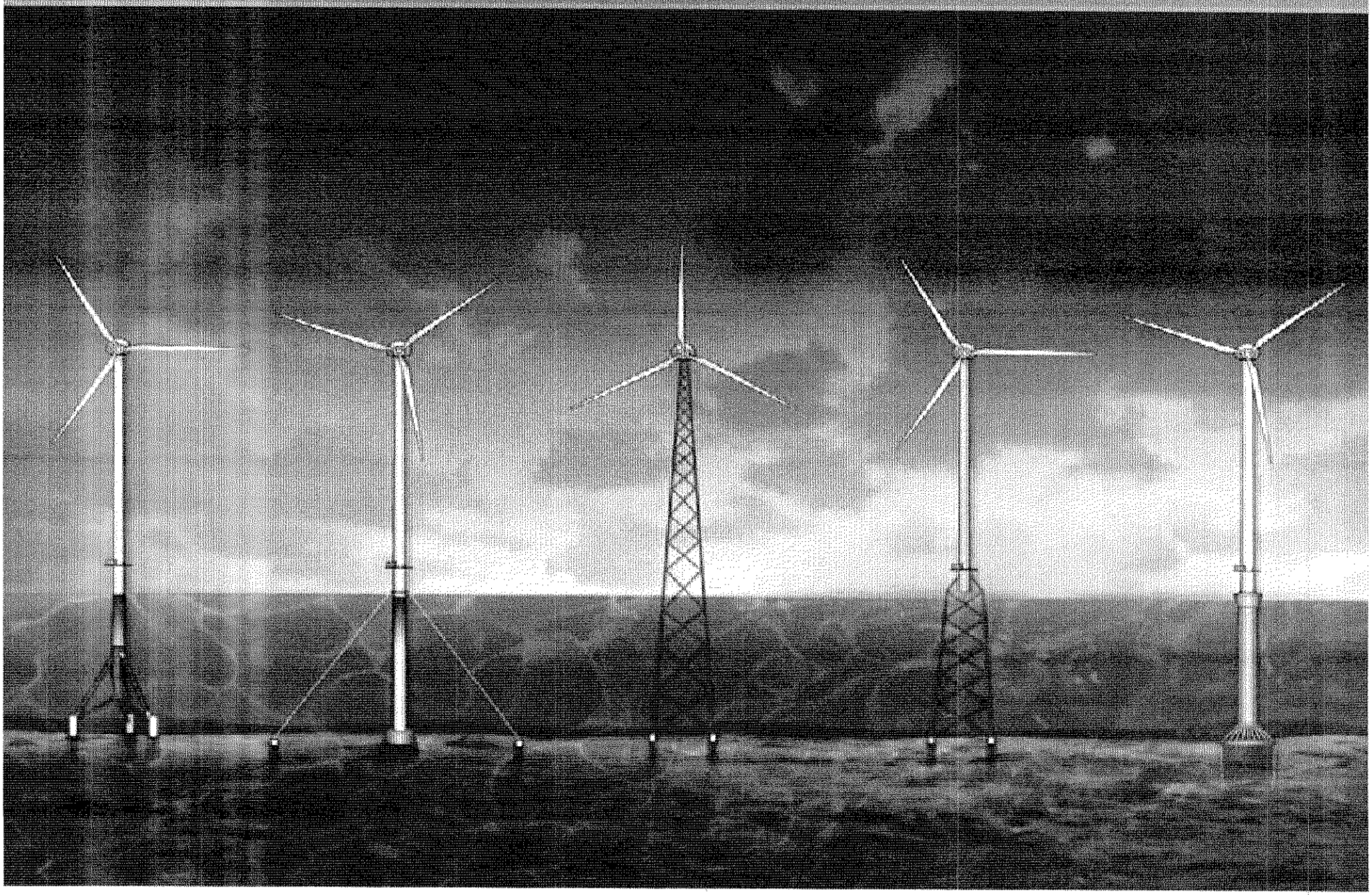
# Transitional Depth Foundations
# 30-m to 90-m Depths??



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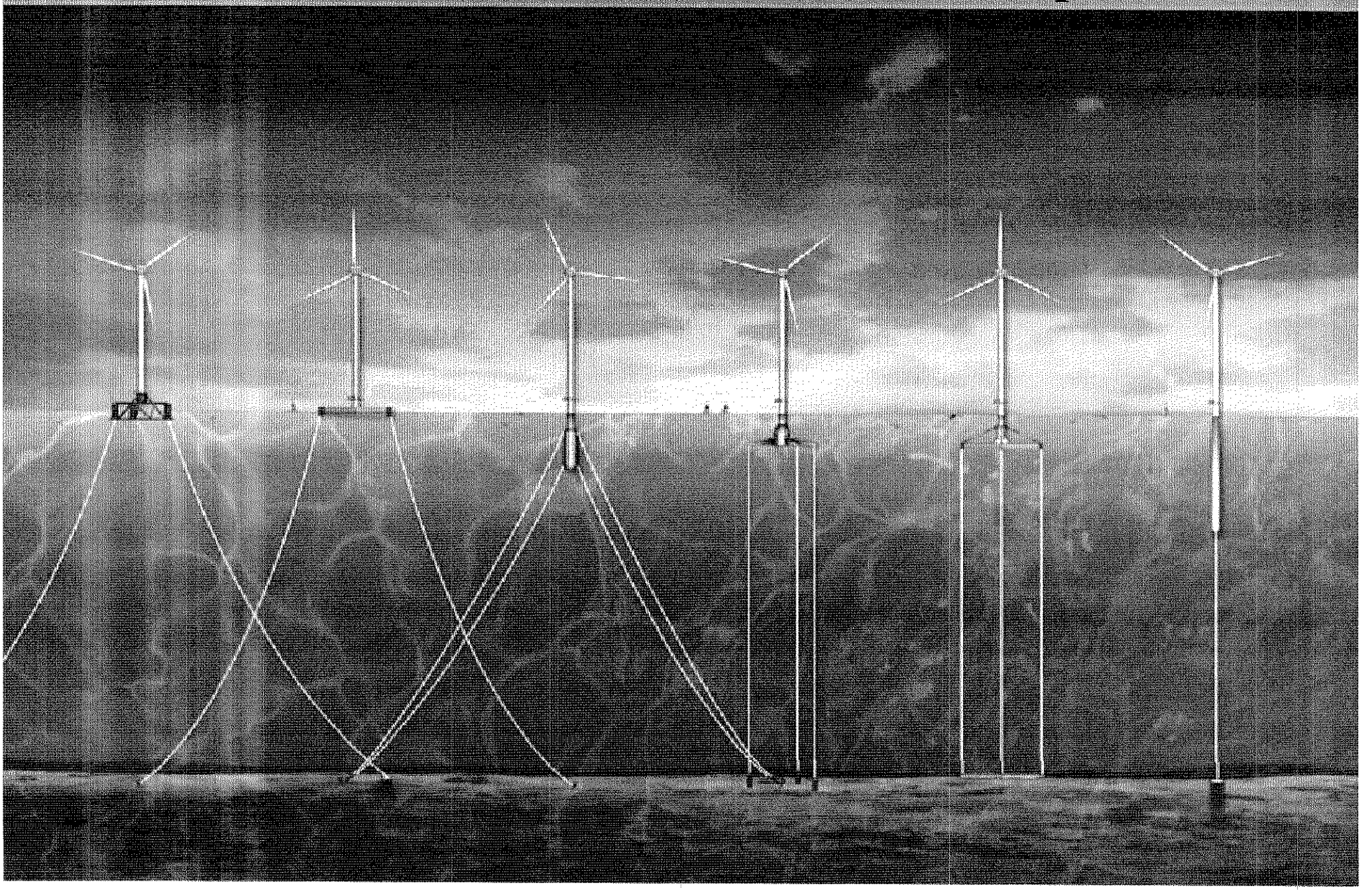
# Floating Foundations >60-m Depths



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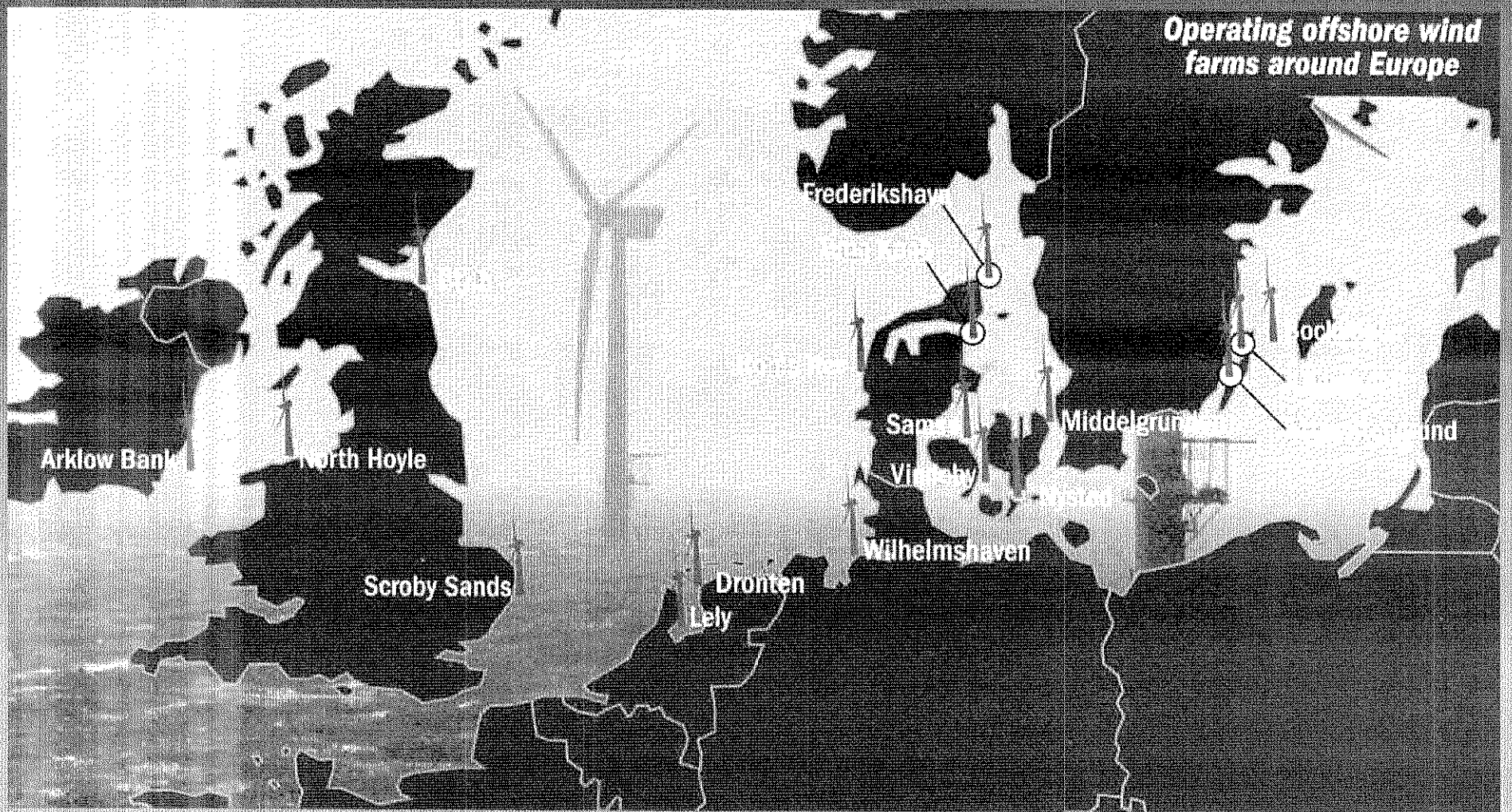
# Location of Existing Offshore Installations Worldwide




Source: Wind Directions, September 2004

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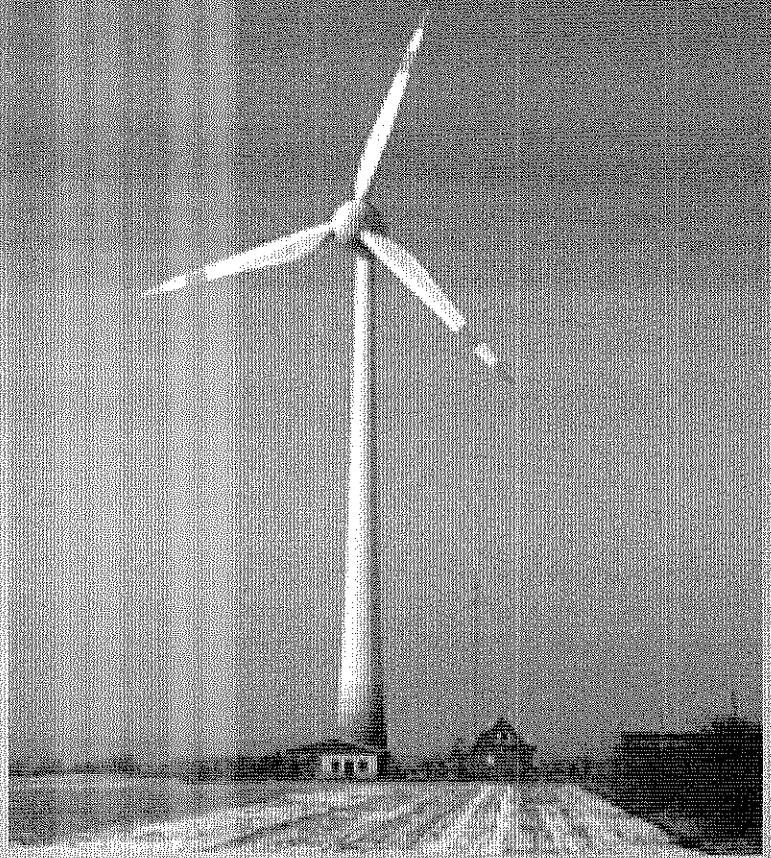
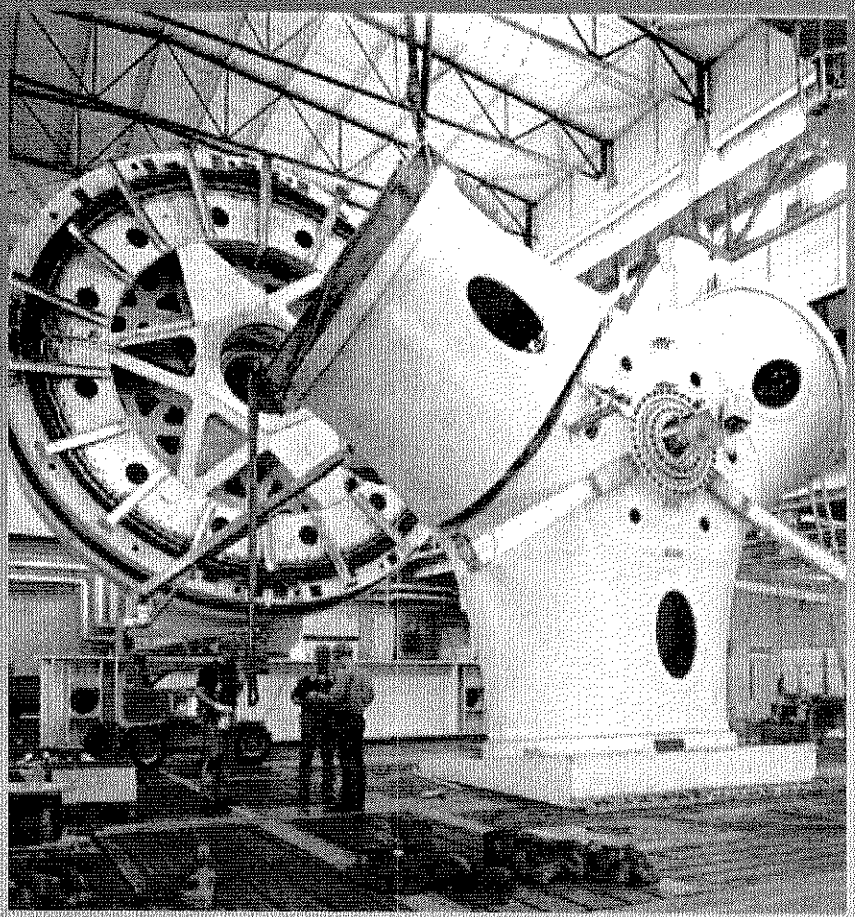
# Enercon 4.5-MW Offshore Prototype



Enercon 4.5MW 112 meter rotor



440 metric tonnes

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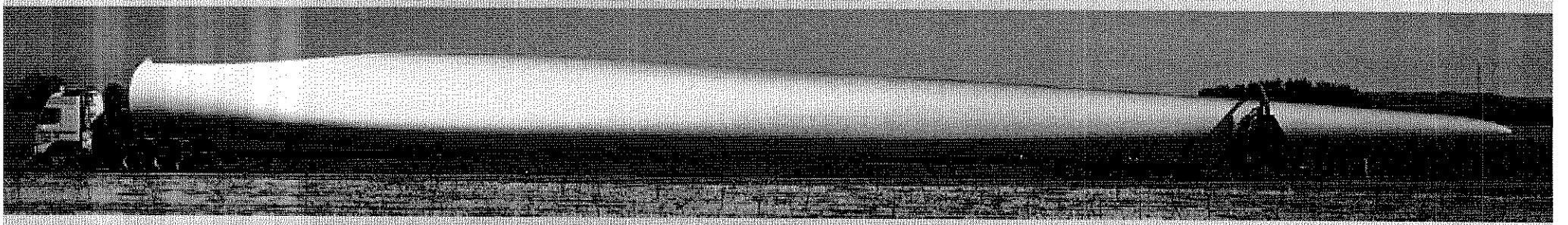
# RePower 5-MW – World's Largest Turbine



- 5-MW Rating
- 61.5-m blade length (LM Glasfibres)
- Offshore Demonstration project by Talisman Energy in Beatrice Fields
  - 45-m Water Depths
  - Two machines



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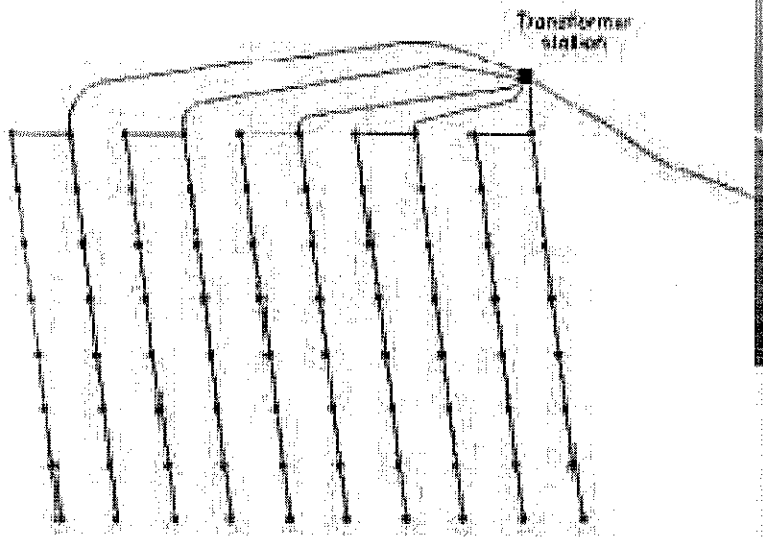
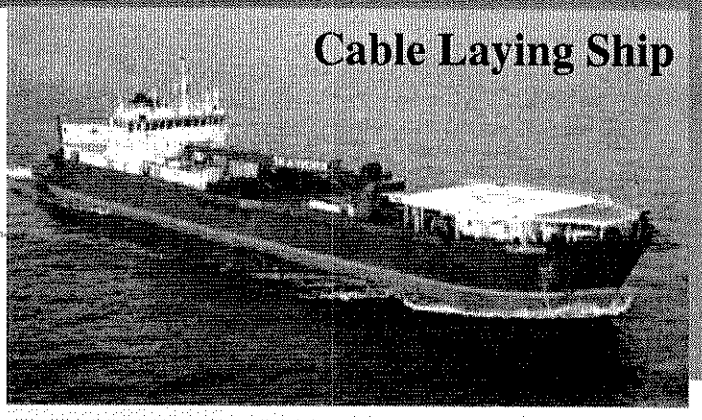
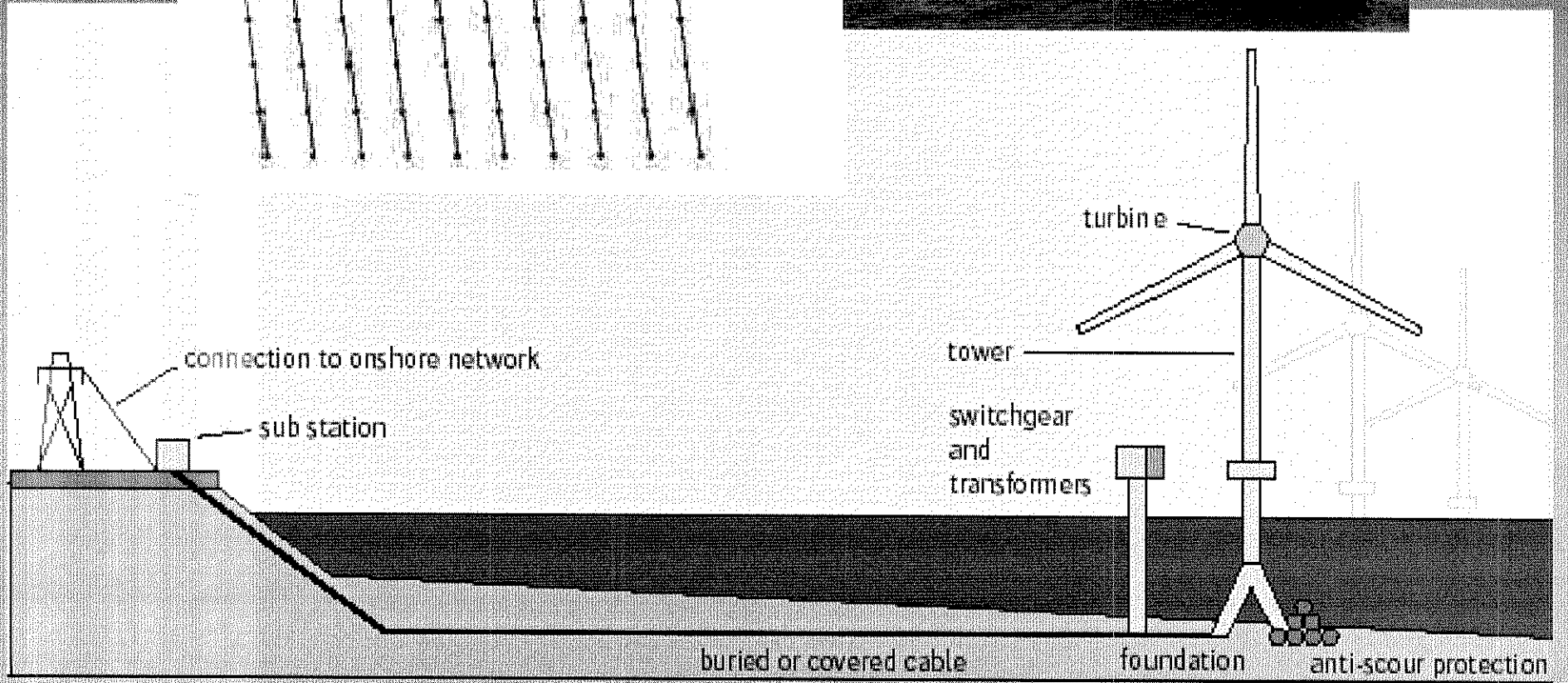
# Typical Offshore Wind Farm Layout




Homs Rev

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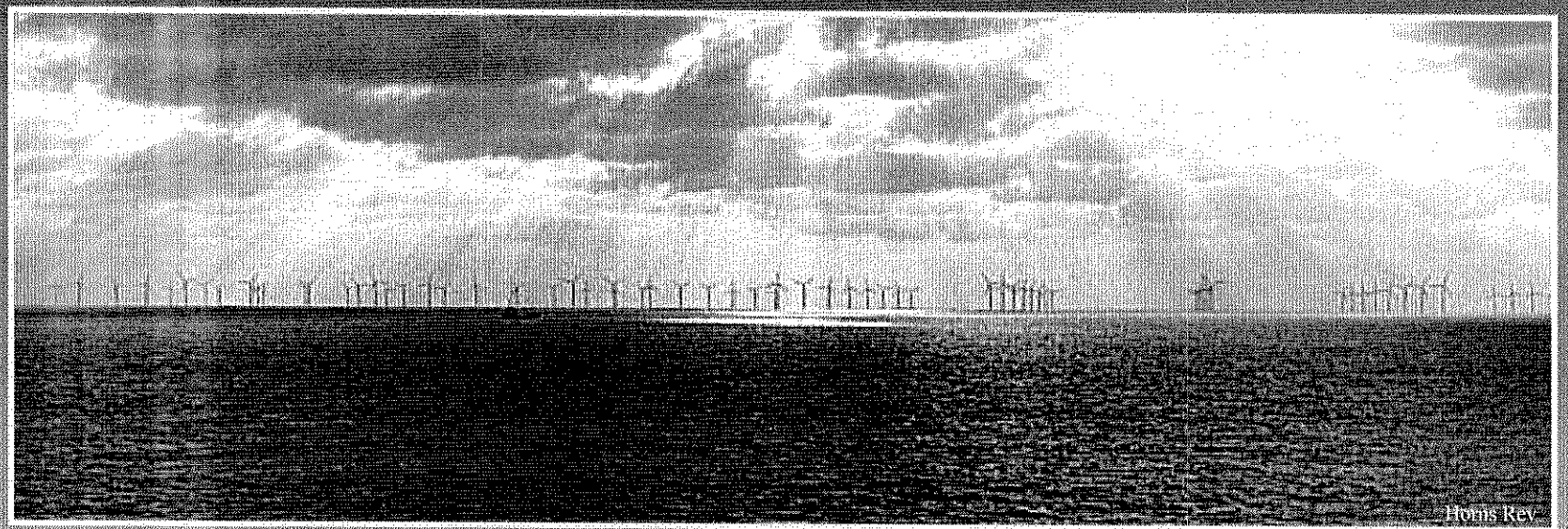
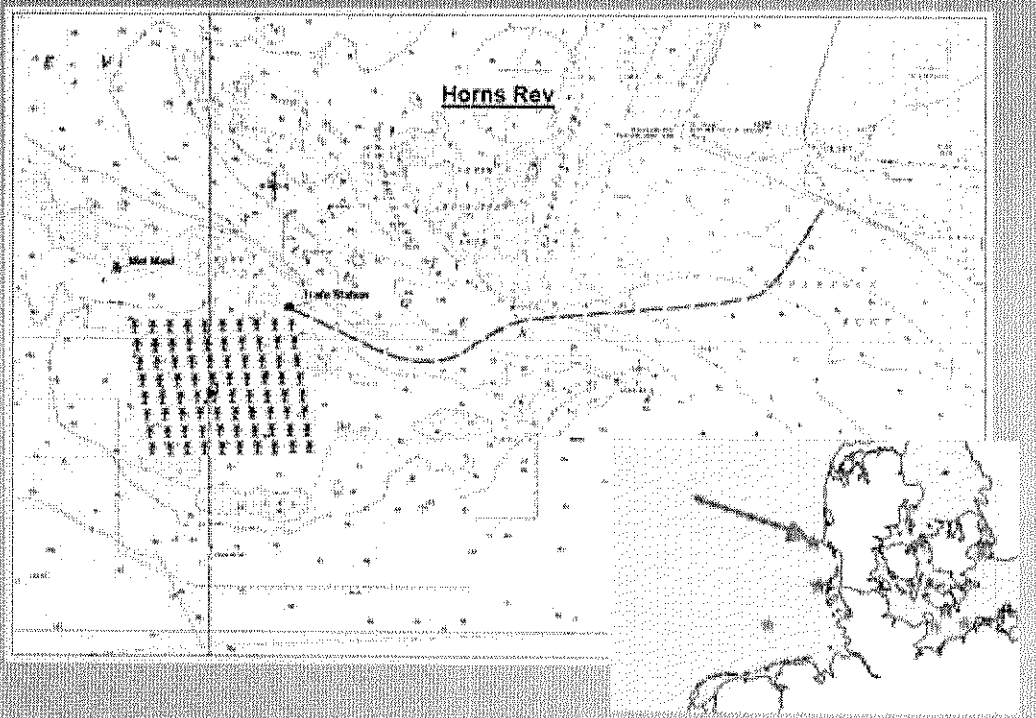
# Horns Rev Wind Farm - Denmark




**Country:** Denmark
**Location:** West Coast
**Total Capacity:** 160 MW
**Number of Turbines:** 80
**Distance to Shore:** 14-20 km
**Depth:** 6-12 m
**Capital Costs:** 270 million Euro
**Manufacturer:** Vestas
**Total Capacity:** 2 MW
**Turbine-type:** V80 – 80-m diameter
**Hub-height:** 70 m
**Mean Windspeed:** 9.7 m/s
**Annual Energy output:** 600 GWh



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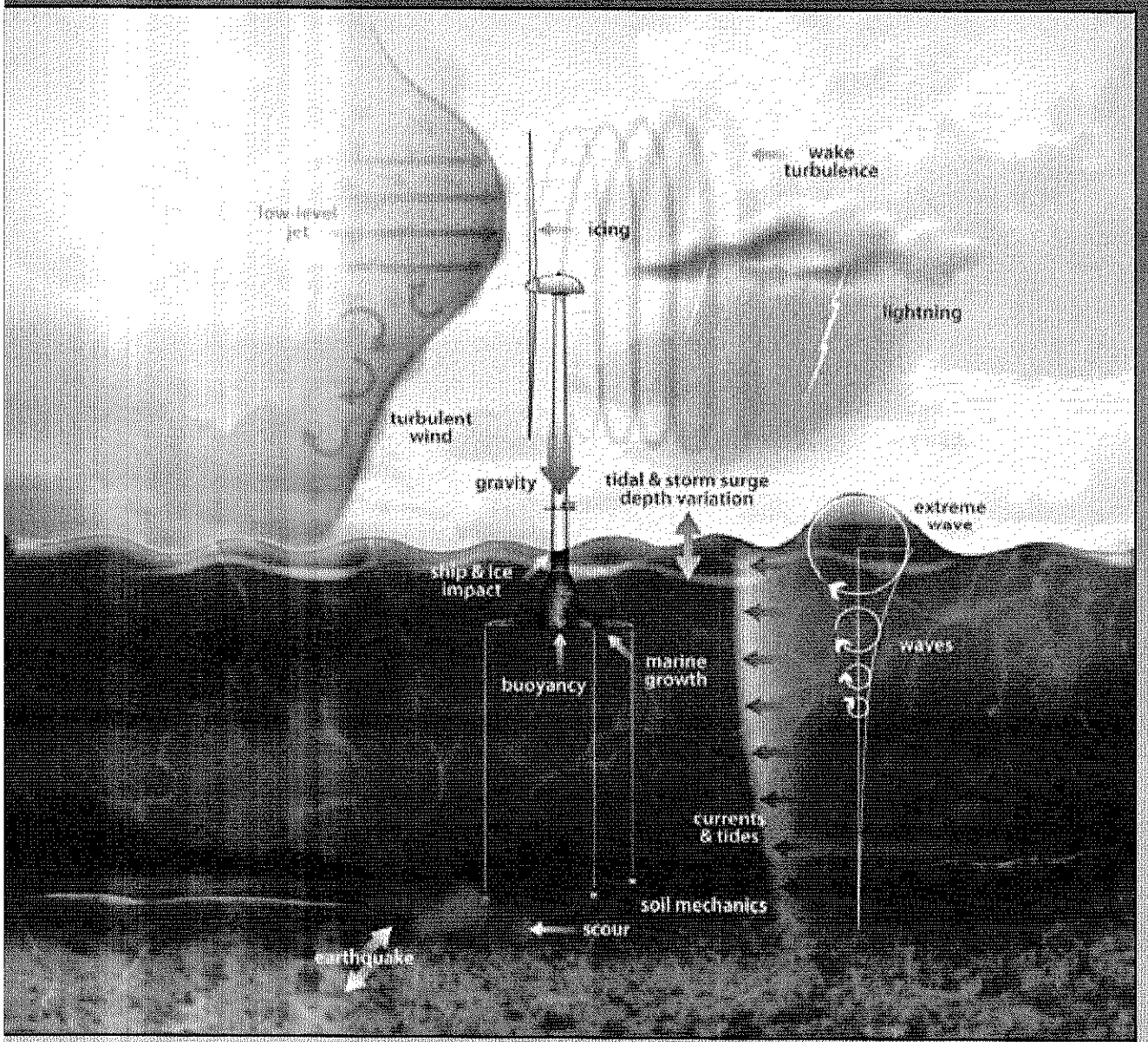
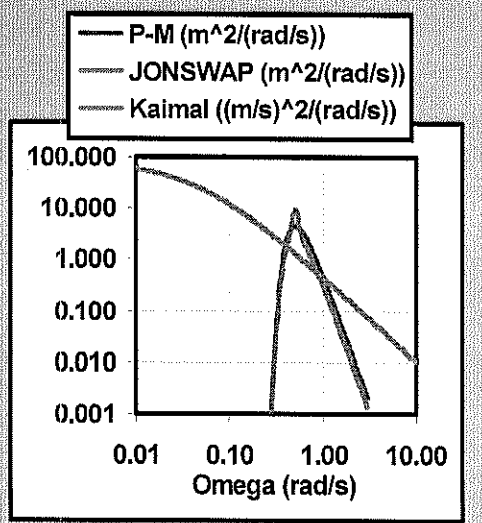
# Offshore Technical Challenges




- Turbulent winds
- Irregular waves
- Gravity / inertia
- Aerodynamics:
  - induction
  - skewed wake
  - dynamic stall
- Hydrodynamics:
  - scattering
  - radiation
  - hydrostatics
- Elasticity
- Mooring dynamics
- Control system
- Fully coupled cx




*Wind and Wave Spectra*

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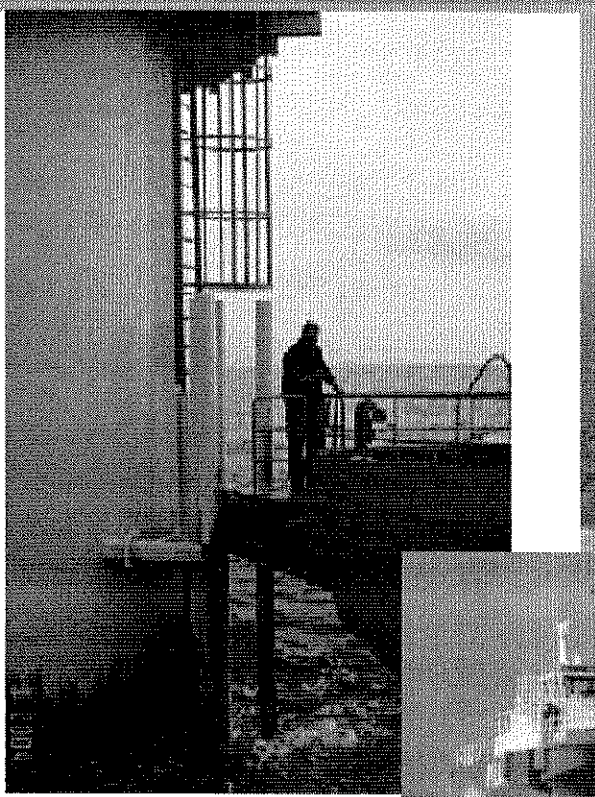
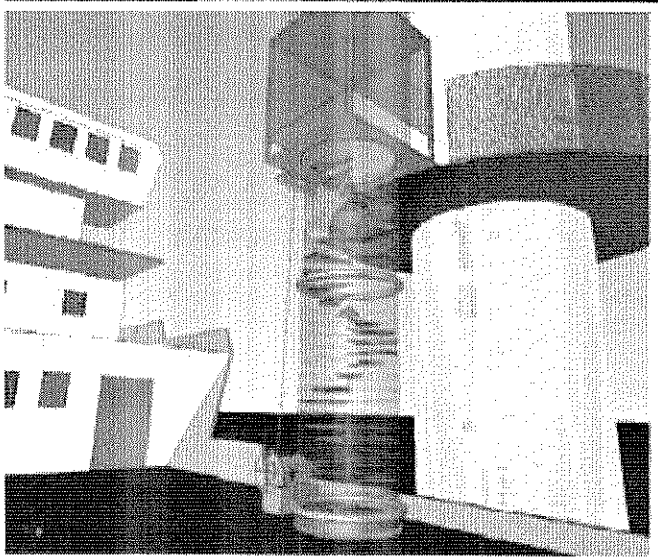
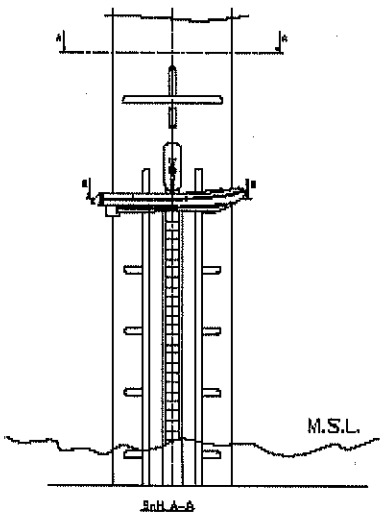
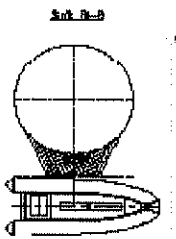
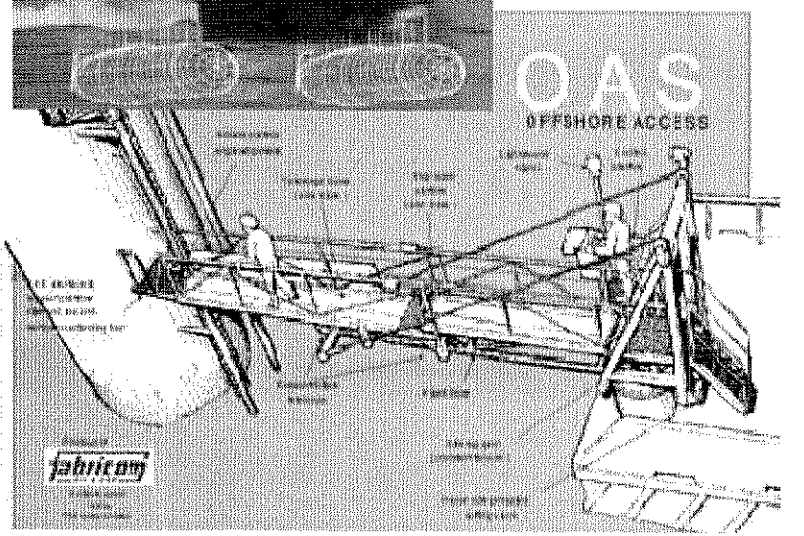
# Offshore Turbine Access





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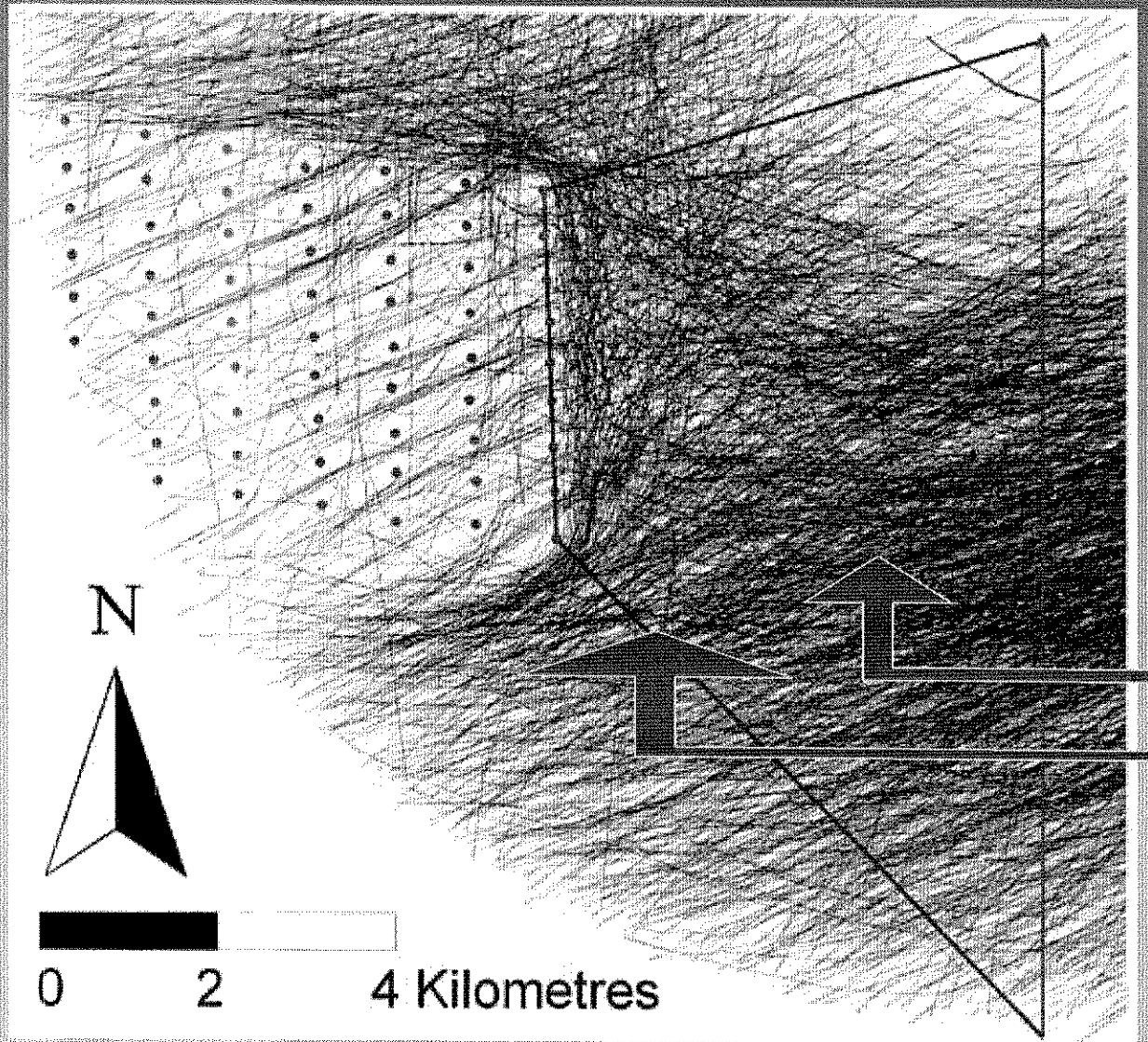
# Radar Images of Migrating Birds at Nysted Wind Power Plant - Denmark




Operation (2003):

Birds perceive the presence of wind turbines even in bad visibility

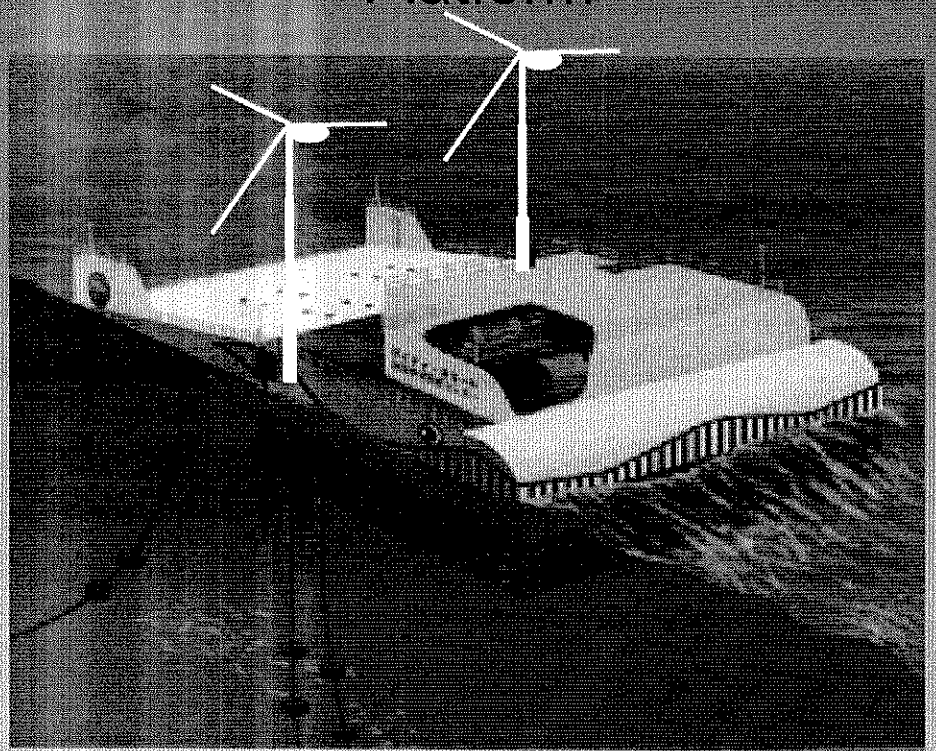
Response distance:

day = c. 3000 m

night = c. 1000 m

# Offshore Wind / Wave Synergy

## Small Wind-OWC Wave Platform



**EPRI Building a Coalition of Developers, Universities and Other Stakeholders to Explore the Wind / Wave Development Potential**

- **Common Engineering & Design Considerations**
- **Maximize Grid Interconnect Potential Through Dual Technologies**
- **Improve Intermittency & Total Energy Output**
- **Increase System Reliability & Reduce Maintenance**

**Wind / Wave Integrated Platform**

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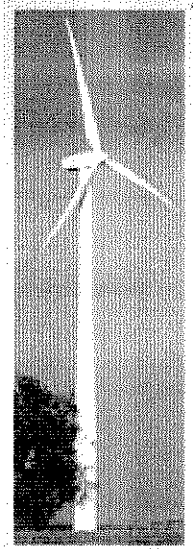
# A Future Vision for Wind Energy Markets

## Today 2005



**Bulk Power Generator**
**4-6¢ at 15 mph**

- Land Based
- Bulk Electricity
- Wind Farms

**Potential 20% of Electricity Market**

## Tomorrow

**Land Based Electricity Path**

**Land Based LWST Large-Scale 2–5 MW**

**Transmission Barriers**

**LWST Turbines:**
- 3¢/kWh at 13 mph
- Electricity Market

**2012**

**Offshore Electricity Path**

**Offshore Turbines 5 MW and Larger**

**Cost & Regulatory Barriers**

**Offshore LWST Turbine:**
- 5 Cents/kWh
- Shallow/***Deep*** *Water*
- Electricity Market
- Higher Wind Sites

**2012 and Beyond**

**Advanced Applications Path**

**Land or Sea Based:**
- **Hydrogen**
- **Clean Water**

**Cost & Infrastructure Barriers**

**Custom Turbines:**
- Electricity
- H2 Production
- Desalinate Water
- Storage
- Multi-Market

**2030 and Beyond**

# RHODE ISLAND OFFSHORE WIND STAKEHOLDERS FINAL REPORT

**February 2008**

**Prepared for**
**Rhode Island Governor Carcieri**
**and the**
**Rhode Island Office of Energy Resources**

**Prepared by**
**Peregrine Energy Group, Inc.**
**45 School Street**
**Boston, Massachusetts 02108**

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## EXECUTIVE SUMMARY

In the summer of 2007, Rhode Island Governor Carcieri invited representatives from Rhode Island communities, the state's environmental community, maritime businesses and industry, and governmental officials to participate in discussions regarding the development of a wind farm in Rhode Island area waters. A study commissioned by Rhode Island in 2006 and completed in winter of 2007 had determined that 15% or more of Rhode Island's electricity requirement could be supplied by offshore wind farms and, further, that 10 specific areas were suitable for consideration as wind farm locations.

The Stakeholder Process was a series of four meetings in August, September, and October 2007. Meeting attendees included stakeholders (defined as town and city representatives, environmental organizations, local economic development organizations, and commercial fishing interests) as well as other participants (including state government agencies, U.S. Coast Guard, area university representatives, National Grid, consultants to the RI Office of Energy Resources, and others) who contributed technical information to the process.

Stakeholders identified a set of issues that they felt could, would, or should affect the siting of offshore wind farms in Rhode Island area waters. The Office of Energy Resources' consultants then provided stakeholders with additional information to help focus and clarify the issues raised and determine, where possible, which issues were most relevant to which sites.

The Stakeholder process was successful in identifying issues that appeared to be particular to some sites and not others. There was agreement that the formal environmental impact analysis and permitting processes that will come next, if Rhode Island elects to further pursue the wind option, can be used to compare and contrast the relative merits of the alternative sites.

Overall, participants in the Stakeholder process expressed their support for the concept of using wind energy to satisfy some portion of Rhode Island's future electricity needs, their approval that the Governor and Office of Energy Resources are investigating this potential opportunity for Rhode Islanders, and their desire to continue participating in future discussions and decision making on this topic.

## INTRODUCTION

In January 2006, Governor Carcieri directed Rhode Island's Office of Energy Resources to determine whether 15 percent of Rhode Island's electricity requirements could be satisfied using wind generated electricity. Today, Rhode Island's average annual demand is 1,000 megawatts, supplied mostly by conventional fossil fuel burning and nuclear power stations. Approximately 400 megawatts (in nameplate capacity) of economical utility-scale wind turbines would be necessary to achieve the 15 percent goal.

A competitive solicitation by the state resulted in the selection of a study team to carry out the investigation. Over the next year, the team, working with representatives of the Office of Energy Resources and the Rhode Island Economic Development Corporation, evaluated the Rhode Island wind energy potential looking both at onshore and offshore sites. Their report, released in April 2007 found that:

- There are sufficient economical wind resources in Rhode Island to meet Governor Carcieri's 15 percent target
- Of the total resource available, 98 percent is located offshore and 2 percent is located onshore
- The offshore areas total 98 square miles
- 78 percent of the offshore opportunity is in state waters
- The total offshore resource, if fully developed using technology available today and without any additional siting constraints, could supply as much as five times the 15 percent goal

## THE STAKEHOLDER PROCESS

Recognizing the need to include a broad range of perspectives and interests in the discussion of how Rhode Island should respond to this wind opportunity, Governor Carcieri initiated a Stakeholder Process. He invited the participation of Rhode Islanders who could speak to the issues that developing this native Rhode Island energy resource raised, and this group continued to grow organically throughout the process as additional interested parties joined. A list of participants and their affiliation is attached to this report.

### *First Stakeholders Meeting: August 30, 2007*

Forty persons attended the opening meeting of the RI Offshore Wind Stakeholders. Andrew Dzykewicz, Commissioner of the RI Office of Energy Resources, welcomed participants and established the theme for the meeting: identifying and selecting the best sites for offshore wind generation for RI, with the goal of supplying at least 15% of the electricity used in Rhode Island using wind power. Mr. Dzykewicz introduced Rhode Island Governor Carcieri.

Governor Carcieri reflected on the importance of Narragansett Bay's recreational uses to the state's residents and the state's economy. He stressed his belief that protecting the Bay is compatible with using the Bay to support RI's future economic growth. Describing this as a "watershed moment," he expressed his excitement about the prospects for developing offshore wind development as a strategy to help RI take control of its energy future. He asked for the participants' assistance in selecting wind farm sites and exploring their ramifications so that RI can move forward with using this energy resource.

Representatives of the Rhode Island Wind Energy Study team, which had analyzed RI's wind generation potential, presented their methodology, findings, and recommendations. A copy of the summary of their site ranking report, delivered to the Governor, and their August 30, 2007 presentation is attached.

The team reviewed their analytical process and conclusion that RI and its nearby waters have a technical wind generation potential of approximately 6.6 million megawatt hours per year, based on wind speeds and available sites and taking into account a variety of siting constraints. Their economic analyses found that the largest offshore projects would also be the most cost-effective to pursue, taking into account costs for equipment, installation and interconnection with the power grid, ongoing operation and maintenance, and other typical expenses. Further, based on forward analysis of future market prices for power, this wind development would appear to be able to generate power at a wholesale price competitive with conventional power sources.

ATM closed its presentation by summarizing opportunities and challenges related to wind development in RI. The greatest opportunity by far for wind development for Rhode Island is offshore (98%), driven by excellent offshore wind resources. With the price for wind generated power primarily a function of its first cost for installed equipment, RI can expect stable and predictable prices from such projects as well as the

environmental benefit of clean power generation. These projects can also create opportunities for RI businesses, further contributing to the state's economic strength.

There also are a number of challenges that must be faced as RI pursues this opportunity. If turbines were operating in Rhode Island waters today, there would be insufficient electrical transmission capacity near shore to distribute power that would be produced. Further, the cost for the wind generation and related infrastructure necessary to meet the 15 percent goal will be in the $1 billion-plus range. Securing the necessary project financing in New England could be difficult. Delays in securing equipment should be anticipated in the face of international demand that exceeds supply. Finally, broad public support for this initiative will be necessary.

In closing the meeting, Commissioner Dzykewicz asked the group to participate in two additional meetings to identify and discuss issues related to offshore wind development and to determine which site or sites were most suitable for such development, setting the stage for initiating the permitting process by the end of 2007.

***Second Stakeholders Meeting: September 20, 2007***

The objective of the second Stakeholder meeting was to identify issues and concerns that would need to be addressed with respect to individual sites. In anticipation of the meeting, Office of Energy Resources consultants initiated a series of telephone interviews with individual stakeholders to begin to document specific issues and provide a basis for group discussion.

Commissioner Dzykewicz opened the meeting by clarifying the respective roles of invitees and participants in the Stakeholder Process. He differentiated between Stakeholders, representing Rhode Island's cities and towns and non-government organizations with missions giving them an interest in the siting of wind farms in Rhode Island area waters, and all other Participants, who were there as resources to support the Stakeholders in discussions and deliberations. He stated that the goal of the meeting was to agree on issues that were important to Stakeholders as they considered the proposed alternative sites for offshore wind development.

Interview responses had been organized into categories and were presented to meeting attendees for review and discussion. Additions to the list of issues were offered by participants, discussed by the group, and incorporated into the master list. Finally, the entire list was critiqued by all participants to identify those issues that the group agreed were relevant to the comparison of individual sites.

The list of issues identified by stakeholders is attached to this report.

Given the number of issues raised and the amount of information required to address them, two additional meetings were scheduled, for October 24, 2007 and October 31, 2007. These meetings would be used to present information needed to address issues and concerns raised by stakeholders and to differentiate the individual Areas identified in the study, in terms of these issues, as more or less suitable for wind project development.

***Third and Fourth Stakeholders Meetings: October 24 and 31, 2007***

The goal of the October meetings was to discuss the issues that had been identified by stakeholders and provide additional information and clarifications. This was also an opportunity for stakeholders to ask questions and express their thoughts and concerns about how a specific issue or set of issues might affect the viability of a potential wind farm site identified in the ATM study.

In planning for these final two meetings, the Office of Energy Resources decided that the limitations of this Stakeholder process did not lend itself to development of a definitive recommendation of a single site to be permitted, as had been originally hoped, but rather to identifying Area-specific issues and concerns which would help differentiate the relative merits of the individual Areas.

Office of Energy Resources consultant Applied Technology and Management (ATM), co-authors of the Rhode Island Wind Energy Study, presented an overview of the overall offshore wind project development process, from initial screening and feasibility analysis through construction and commissioning, to put the deliberations of the stakeholders group in a larger context.

Commissioner Dzykewicz stressed, as he had before, that ongoing stakeholder involvement in the environmental permitting process will be critical to the success of the process and that the stakeholders' interests and issues will be reflected in the scope of that process.

Specific points of discussion:

Physical characteristics of the wind farms

There was extensive dialogue about the potential size and location of groupings of turbines in the specific offshore Areas, the nature of the foundations and supports for the towers, their tolerance to 100 year storm conditions, and the potential effects of different sub-strata on tower design and installation.

Commercial shipping and cruise ship routes

Information presented by ATM showed that all of the Areas are outside the shipping lanes which are used by commercial and cruise ship traffic. The U.S. Coast Guard representatives stated that the any towers would be treated as "private aids to navigation" and be required to meet Coast Guard lighting standards and fog horn requirements. Marine wind turbine locations would ultimately be charted with other fixed obstacles on ocean charts.

Sailing regattas

While there are numbers of regattas and races held in the Bay and Sound, the only potential conflict mentioned was for ***Area C*** off of Point Judith.

Recreational fishing and boating

There is extensive recreational fishing and boating in the Bay, along the south coast, and around Block Island. Smaller boats tend to operate closer to shore and would be more

affected by near shore wind farms. The south side of Block Island and southwest ledge there, near ***Areas J and K***, was identified as a "top fishing spot in New England."

The possibility of deleterious effects on fishing during and after the installation of foundations is of concern to the recreational fishing and boating community, and will be studied in detail during the permitting/EIS process. A representative of the saltwater anglers did indicate however that placement of rubble around the monopoles could increase or improve fish habitat and opportunities for fishermen.

Commercial fishing

Commercial fishing interests invited to participate in the process included shell-fishermen, lobstermen, and boatmen that harvest bottom fish and other species. While shell-fisherman did not attend the meetings it was relayed from the President of the RI Shellfishermen Association that the potential areas identified in the study are outside their areas of interest which reside within Narragansett Bay Commercial fisherman expressed support for the concept of wind energy replacing conventional pollution-creating electricity generation, but also emphasized their concerns that the life-cycles of species important to the commercial fishery, as well as fishermen's livelihoods, could be adversely affected by wind projects. Particular concerns include:

- Potential for adverse impacts on egg laying and fish food stocks during the construction process, potential disruption of ocean currents that are critical to life cycles of particular species, and how the design and placement of wind farms could affect fishing practices.
- Fishermen noted that many species transit through these areas and that there would be no benefit to creating additional 'artificial' bottom structures for them.
- ***Areas B and F*** were identified as prime fishing areas for squid and flounder and areas where squid eggs are laid and develop. In addition to squid's value as a commercial species, it is also an important food source for other commercial species.
- ***Areas J and K*** are important flounder and cod fishing areas.
- Lobstermen use the entire offshore area for trapping and feared that driving monopoles into ledge on the bottom would create problems. Lobster interests were particularly concerned about the Little Compton, Middletown, and Newport waters, ***Areas D and G*** potentially, where lobster eggs are laid and hatch. Lobster eggs travel on the ocean currents and lobstermen asked for studies to identify any potential effects on these currents by wind farms. That said, they think it is possible for such projects to be built in the "right places" if it is done responsibly.

Rhode Island Department of Environmental Management provided maps it had prepared that incorporated information gathered from the Marine Fisheries Program concerning fishing grounds in proximity to the identified offshore Areas and integrating NOAA charts with suggested wind farm sites.

Military traffic

While no specific conflicts with military traffic were identified, there was some discussion of potential submarine traffic and torpedo testing which might be in the area. It is expected that no information about such activity would be available until such time as there is a specific proposal that would create a problem. It should be noted that areas labeled as torpedo testing on NOAA navigation charts were removed as potential sites, however these charts may not reflect a comprehensive inventory of all areas of interest of the military.

Tourism and property values

There were concerns expressed about the potential adverse impacts on tourism from near-shore wind development, particularly with respect to the south shore beaches. This is a significant economic resource for Rhode Island with tourists coming from out of state to enjoy these beaches. While tourism officials acknowledged that beauty is in the eye of the beholder and that some persons may be attracted to the views created by wind farms, wind development near the south shore raised concerns, particularly about ***Area F*** and ***Area A*** and perhaps ***Area D*** and ***Area G.***

Lighting and other warning signals

There was discussion of the lighting that would be required by Federal Aviation Administration rules to protect aircraft against collisions with turbines. Coast Guard representatives also provided information regarding their lighting requirements. Each turbine would be permitted by the Coast Guard as a "private aid to navigation" and integrated with existing federal aids to navigation. The objective of the Coast Guard lighting requirements is to reduce confusion to traffic, and not to increase it by creating a "Coney Island effect." Towers would not be topped with strobe lights.

In addition to specific perimeter and interior lighting requirements for visibility from ships, fog horns will be required that are audible at one half mile distance. The lighting and fog horn requirements could be perceived as an on-shore nuisance when sites are near shore; on the other hand, they likely will be welcomed by boaters as additional navigation aids.

Environmental resources, including wildlife habitats

Environmental impacts of projects proposed for specific areas will be studied extensively through the environmental permitting process. This will include a public "scoping process" to ensure that all issues that are important to the public and stakeholders are addressed in the environmental analysis. The analysis will also include an investigation and comparative assessment of alternative sites.

While there was not sufficient environmental information presented in this process to differentiate the environmental impacts of developing wind farms on the alternative locations, a few specific observations were brought forward about individual Areas. ***Area A*** was identified as being on a prime migration route for both raptors and song birds. ***Area D*** was identified as particularly important to the life cycle of harlequin ducks (which are recognized as endangered by Canada though not by the United States). In addition, the Audubon Society of Rhode Island shared a recent study completed at

University of Rhode Island that summarized the numerous sightings of marine mammals in recent years in the waters off Rhode Island.

There was additional specific discussion of research results from URI that showed considerable numbers of marine mammal sightings in Long Island Sound eastward to Rhode Island. This will be an area for future study as specific projects are considered.

Aesthetics

Views of wind farms and potential sound associated with their operation were identified as issues which could be big differentiators between certain near shore and further off shore sites. Simulations of the views of wind farms prepared by Roger Williams University students and faculty were presented. They showed Areas E and H (as seen from Sakonnet Point in Little Compton) and Areas J and K (as seen from Black Rock on the southwest shore of Block Island). Vantage points were selected to provide representative views of the scale of turbines.

"Expectation of remoteness" was a concept raised to describe how certain locations might feel inappropriate for nearby large-scale wind development. Tourism officials spoke to the need for sensitivity to the landscape values that brought visitors to South County beaches. Another observation was that changes to typically visible wildlife behaviors (e.g. whales sounding) caused by the presence of turbines would be another visual impact. There was agreement that there would be fewer objections where farms were sited a greater distance from shore.

Interconnections to the utility grid

Costs for utility interconnection from individual Areas were included in pro-formas prepared for each Area, but interconnection issues could represent another differentiator between sites when specific proposals are made for needed onshore infrastructure improvements. Certain routes may be more difficult than others to secure permits for. Buried and pole-mounted transmission cable options will need to be explored. Capacity limitations of equipment at landing spots will need to be matched with anticipated production by wind farms. At the same time, National Grid noted that South County is experiencing the highest demand growth, perhaps arguing an additional benefit for favoring that location as a landfall for bringing power onshore.

These points and others could prove to be Area differentiators when detailed interconnection and transmission planning begins, though in most cases, they will just result in adjustments to project cost estimates. National Grid representatives observed that the permitting process for land-side transmission facilities will be extensive.

Electrical service platforms will be required to "transform" power from turbines to higher voltages for transmission by underwater cable to the onshore grid. Platforms were described as 25 by 25 feet, unmanned, numbering 2 or 3 in each Area, and daisy-chained for accumulating power produced. Each would likely be attached to a turbine tower. There was also discussion of potential use of such locations for research facilities or ocean observatories.

Economics

The relative cost for energy produced was the screen that identified the combinations of ***Areas E / H and J / K*** as least-cost locations for offshore wind farms, on a dollars-per-megawatt hour (MWH) basis. This cost ranged from $94 per MWH to $137 per MWH. While cost proved to be a significant differentiator which might make one location more attractive than another for development in the near term, it does not eliminate an Area from future consideration and development if, at that future date, the public value created, site acceptability, and project economics are determined to be favorable.

The build-up of these cost estimates was shared with participants, accompanied by the detailed information included in the RI Wind Energy Study. Estimates include 20% contingency adders. Presenters noted that there is some interactivity in the pricing when contiguous Areas create economies of scale. They also explained that operation and maintenance costs are not part of the construction estimates. Detailed engineering and analysis will refine these estimates significantly. This will include extensive analysis of the sea bottom in the individual areas to evaluate the engineering, design, and cost implications of working with the site-specific geology.

Risk Assessment

A discussion of risks posed by large vessels straying into ***Areas J and K*** briefly touched on potential for collisions with wind turbines or interference with U.S. Naval Operations. ***Area J*** in federal waters was identified as the potentially bigger problem due to its closer proximity to sea routes and shipping channels, but the magnitude of this risk was not quantifiable at this time.

***Community Meetings: Block Island, November 8 and 10, 2007***

In the first of what are anticipated to be a series of meetings with communities that see themselves as potentially affected by the siting of an offshore wind farm in one or more of the Areas identified, Office of Energy Resources staff and their consultants presented an overview of the Rhode Island Wind Energy Study results to Block Island residents.

The meetings were initiated and organized by New Shoreham's representative to the Stakeholder Process and sponsored by local Block Island organizations. The objectives of the two Block Island meetings were 1) to inform Block Island residents about the conclusions of the Wind Energy Study and 2) to solicit their comments and concerns about potential wind development in Areas K and J south of the island.

Residents who attended had two primary responses to the potential for development in the area. The first was to consider what they might be losing if these projects were built. Concerns expressed focused almost entirely on the visual impacts of a wind farm on island residents (e.g., apparent size of towers as seen from shore, lighting requirements and their night time effects) and uncertainty as to what such projects might mean to the value of properties on the south end of Block Island with direct views of the affected seascape.

The other response was to consider what Block Island could gain from such a project if power produced could be brought to the island economically and used to supply island residents. Block Island power is presently supplied by diesel generators on the island and power costs approach $0.40 per kilowatt hour. A wind project off Block Island would not only bring wind power to the island, but would also connect the island by cable to the mainland (which would not otherwise be economical) resulting in mainland electric rates for Block Island residents even when the offshore wind farm was not producing. Some residents suggested that this scenario might also include upgrades to the island's power distribution network. It was clear to residents that if Areas other than those near Block Island were developed, none of these benefits could accrue to them.

## SUMMARY OF STAKEHOLDER PROCESS FINDINGS

After the four days of formal meetings, the Stakeholders Group supported the concept of Rhode Island securing some significant portion of the electricity consumed by Rhode Islanders from offshore wind farms. There was consensus that additional extensive research and analysis will be required to evaluate and select final locations, as well as to permit and build one or more wind farms off of Rhode Island.

### *General Findings*

The process was successful in identifying differentiating issues that appeared to be particular to some sites and not others. However, none of the potential offshore sites identified by the RI Wind Energy Study were eliminated by the Stakeholders Group from further consideration. At the end of the four-meeting process, it was left to the Office of Energy Resources to determine which Area or Areas would be most immediately pursued for development, based on projected economics, Stakeholder concerns, permitting requirements, and the state's financial capacity. It appeared that any and all Areas identified through and remaining after the multi-stage screening process are viable as future wind energy generation locations if site-specific issues and concerns are effectively managed.

### *Specific Findings by Area*

***Area A* – 3.7 sq. mi., off Westerly, state waters, wind speed 7.75 m/s**

- Tourism organizations expressed particular concern that development in this area could adversely affect summer tourism and reduce the economic benefits tourism creates for Rhode Island
- In addition to general concerns expressed about the impact of wind farm development in all areas on wildlife habitat and migrating species, this area was identified by conservation organizations as being on a prime migration route for raptors and shore birds

***Area B* – 5.36 sq. mi., off Charlestown, state waters, wind speed 8.25 m/s**

- Prime fishing areas for squid and flounder
- Areas where squid eggs are laid and develop, also serving as food source for commercial species
- Construction impacts on fisheries are a concern here

***Area C* – 7.55 sq. mi., off Point Judith, state waters, wind speed 8.25 m/s**

- Identified as potentially conflicting with sailing events
- Extensive fishing boat traffic entering and leaving, though a well-marked wind farm could serve as an important supplemental private aid to navigation

***Area D* – 5.32 sq. mi., off Newport, state waters, wind speed 7.75 m/s**

- Important location for the lobster fishery since lobster eggs are laid and hatch in this Area and then drift on currents and settle; effect of a wind farm on ocean currents in this area needs study
- Location of a significant number of fish traps that are provided for in Rhode Island General Laws (per maps provided by RI DEM)
- Concern expressed about impacts of development of near-shore location on tourism and property values
- In addition to general concerns expressed about the impact of wind farm development in all areas on wildlife habitat and migrating species, this area was identified by conservation organizations as being particularly important for harlequin ducks (which are recognized as endangered by Canada, though not by the United States)

***Area E* – 7.78 sq. mi., off Little Compton, federal waters, wind speed 8.75 m/s**

- In combination with Area H, identified as one of the most cost effective locations for offshore wind, on a dollars per megawatt hour basis, and large enough to achieve the Governor's 15% supply goal

***Area F* – 9.97 sq. mi., off Charlestown, state waters, wind speed 7.75 m/s**

- Prime fishing areas for squid and flounder
- Areas where squid eggs are laid and develop, also serving as food source for commercial species
- Tourism organizations expressed particular concern that development in this area could adversely affect summer tourism and reduce the economic benefits tourism creates for Rhode Island
- Construction impacts on fisheries are a concern here

***Area G* – 22.3 sq. mi., off Newport/Little Compton, state waters, wind speed 8.25 m/s**

- Important location for the lobster fishery since lobster eggs are laid and hatch in this Area and then drift on currents and settle; effect of a wind farm on ocean currents in this area needs study.
- Location of a significant number of fish traps that are provided for in Rhode Island General Laws (per maps provided by RI DEM)
- Concern expressed about impacts of development of near-shore location on tourism and property values

***Area H* – 9.69 sq. mi., off Little Compton, state waters, wind speed 8.75 m/s**

- In combination with Area E, identified as one of the most cost effective locations for offshore wind, on a dollars per megawatt hour basis, and large enough to achieve the Governor's 15% supply goal

***Area J* – 12.94 sq. mi., off Block Island, federal waters, wind speed 9.25 m/s**

- In combination with Area K, identified as one of the most cost effective locations for offshore wind, on a dollars per megawatt hour basis, and large enough to achieve the Governor's 15% supply goal
- Wind farm development in this area could have the additional benefit of bringing economical power to Block Island residents, who are presently supplied by on-island diesel generators
- Southwest Ledge identified as a "top fishing spot in New England" that is a destination for saltwater anglers
- Important flounder and cod fishing areas
- Bottom conditions may require alternative tower structures to the driven monopoles assumed in the site screening. Drilled foundation supports could create tailings that might impact fisheries
- Commercial trawlers expressed concerns that the placement of turbines in these areas might restrict their fishing operations
- Close to major shipping lanes, creating potential for risk to and from large vessels straying into area

***Area K* – 13.14 sq. mi., off Block Island, state waters, wind speed 9.25 m/s**

- In combination with Area J, identified as one of the most cost effective locations for offshore wind, on a dollars per megawatt hour basis, and large enough to achieve the Governor's 15% supply goal
- Wind farm development in this area could have the additional benefit of bringing economical power to Block Island residents, who are presently supplied by on-island diesel generators
- Southwest Ledge identified as a "top fishing spot in New England" that is a destination for saltwater anglers
- Important flounder and cod fishing areas
- Commercial trawlers expressed concerns that the placement of turbines in these areas might restrict their fishing operations
- Close to major shipping lanes, creating potential for risk to and from large vessels straying into area

## RECOMMENDATIONS AND NEXT STEPS

### *Alternatives Impact Analysis*

The Stakeholders observed that much additional information was needed to fully understand the relative merits of the Areas identified, beyond the economic analysis that brought Areas E, H, J, and K to the forefront. They recommended that the Environmental Impact Analysis include a thorough review of alternative Areas and the issues and opportunities they create before final site selection and permitting.

### *Ongoing Public Participation Process*

Commissioner Dzykewicz asked the stakeholders if they would continue to meet to build on their efforts to date and to contribute their perspectives to future analysis and site selection. The stakeholders indicated that they would be willing to do so.

### *Scoping Process for Environmental Impact Review*

Stakeholders specifically asked to be participants in the scoping process that helps define the issues to be included and analyses required in the Environmental Impact Report (EIR). Stakeholders suggested that the EIR should include both the impacts of the development of the offshore Areas and also the impacts associated with necessary landfalls and interconnections with the power grid.

# ATTACHMENTS

1. **Stakeholder Process Participants**
2. **Site Selection Issues Identified by Stakeholders**
3. **Stakeholder Meeting Presentations**

# OFFSHORE WIND STAKEHOLDER PROCESS
# PARTICIPANTS
# AUGUST 30, SEPTEMBER 20, OCTOBER 24 & 31, 2007

| | |
|---|---|
| John McJennett | Adams Hill Consulting |
| Alan Shoer | Adler Pollack & Sheehan |
| Daniel Mendelsohn | Applied Technology & Management |
| Deborah Crowley | Applied Technology & Management |
| Eugenia Marks | Audubon Society of RI |
| Peter Voscamp | Block Island Times |
| Dennis Duffy | Cape Wind |
| Jim Saletnik | citizen |
| Ken Payne | citizen |
| Ed Lavallee | City of Newport |
| Trish Reynolds | City of Warwick |
| Cynthia Giles | Conservation Law Foundation |
| Dan Goulet | CRMC |
| Matt Autin | Environment Rhode Island |
| Randall Carnaham | Gencorp Insurance |
| Chris Long | Governor's office |
| Steve Kass | Governor's office |
| Dennis Loria | Loria Emerging Energy Consulting |
| Dana Walters | National Grid |
| Dave Jacobson | National Grid |
| Dave Larson | National Grid |
| Ed Kremzier | National Grid |
| Henri Daher | National Grid |
| Tim Roughan | National Grid |
| Howard McVay | Northeast Marine Pilots |
| Paul Costabile | Northeast Marine Pilots |
| Vince Kirby | Northeast Marine Pilots |
| Karina Lutz | Peoples Power and Light |
| Omay Ephick | Peoples Power and Light |
| Paul Gromer | Peregrine Energy Group |
| Steve Weisman | Peregrine Energy Group |
| Tim Barmann | Providence Journal |
| Chris Brown | RI Commercial Fishermen's Association |
| Kenneth Ketcham | RI Commercial Fishermen's Association |
| Bob Ballou | RI DEM |
| Janet Keller | RI DEM |
| Mark Gibson | RI DEM |
| Tom Getz | RI DEM |
| W. M. Sullivan | RI DEM |
| Tom Ahern | RI Division of Public Utilities |
| Benny Bergantino | RI DOP / SPP |
| Michael Walker | RI EDC |
| Judy Jones | RI Housing |

| | |
|---|---|
| Larry Dellinger | RI Lobstermen's Association |
| Ken Kubic | RI Marine Trades Association |
| Andy Dzykewicz | RI Office of Energy Resources |
| John McDermott | RI Office of Energy Resources |
| Julie Capabianco | RI Office of Energy Resources |
| Stephen Medeiros | RI Saltwater Anglers Assn. |
| Robert Kalaskowski | RI Senate Policy Office |
| Mike McGiverney | RI Shellfishermen's Association |
| Kevin Flynn | RI Statewide Planning |
| Mark Brodeur | RI Tourism |
| Paul Sanroma | RI Wind Alliance |
| Lefteris Pavlides | Roger Williams University |
| Curt Spalding | Save The Bay |
| John Torgan | Save The Bay |
| Ken Payne | Senate Policy Office |
| Myrna George | South County Tourism Council |
| John Farley | TEC-RI |
| John Paul | TEC-RI |
| Jeff Brenner | Town of Barrington |
| Edward Barrett | Town of Charlestown |
| Don Wineberg | Town of Jamestown |
| William Smith III | Town of Jamestown |
| Robert "Bob" Mushen | Town of Little Compton |
| Roy F. Bonner | Town of Little Compton |
| Samantha Hogan | Town of Middletown |
| Christine Forster | Town of Middletown Wind Committee |
| Diane Johnson | Town of Narragansett |
| Peter B. Baute MD | Town of New Shoreham |
| Ray Torrey | Town of New Shoreham |
| Gary Gump | Town of Portsmouth |
| John McColloch | Town of Portsmouth |
| Robin Schutt | Town of South Kingstown |
| Glenn Steckman | Town of Tiverton |
| Joseph DePasquale | Town of Warren |
| Anthony Guida | Town of Warren citizen |
| James Angelo | Town of Westerly |
| Mike Elliott | U.S. Army Corp of Engineers |
| Alford Danzy | U.S. Coast Guard |
| Kevin Blount | U.S. Coast Guard |
| Alexander Hoar | U.S. Fish and Wildlife |
| David Farmer | URI Graduate School of Oceanography |
| Kate Moran | URI Graduate School of Oceanography |
| Tania Lado Insua | URI Ocean Engineering |

# SITE SELECTION ISSUES IDENTIFIED

## SEPTEMBER 20, 2007

NOTE: Issues that participants decided would be relevant to the recommendation or selection of one or more sites for offshore wind development are in **bold**.]

### Conflicts with Existing Uses

- **Scale of the projects proposed (number, layout, size, maximum height)**
- **Commercial shipping (including impacts of marine accidents and turbine interference with clean-up)**
- **Cruise ship routes**
- **Sailing regattas (e.g. Block Island Race Week, Newport – Bermuda Race)**
- **Potential for reduction of wind available to sailboats in vicinity of wind farms**
- **Recreational fishing and boating effects**
- **Commercial fishing and also authorized trap sites, lobstering, and shellfishing**
- **Operations of military air traffic and submarines**
- **Local and area tourism**
- **Impacts on property values**
- **Commercial air traffic, e.g. at Westerly airport**
- **Wildlife habitats**
- Sea bottom damage, incl. shipwrecks, communication cables, etc.
- Spoils disposal
- **Impacts of necessary and potential wind farm lighting**
- Impacts on other states

### Conflicts with Future Uses

- Foreseeable future offshore uses
- Other future water based energy generation
- Aquaculture

### Impacts on Environmental Resources (on and off shore)

- Creation of new fish habitats
- **Seasonal bird use of area waters**
- **Migratory bird patterns**
- **Pelagic birds**
- **Marine turtles**
- **Sea mammals**
- **Endangered species**
- Quantification of wind power's environmental benefits (i.e., the cost of not doing it)
- Health benefits of wind power vs. other generation (and cost of not doing it)
- Impacts of decommissioning requirements
- **Impacts on ocean currents**

# SITE SELECTION ISSUES IDENTIFIED (CONTINUED)

## Aesthetics

- **Appearance of offshore wind farms (under various environmental conditions)**
- Deterioration of wind turbines due to lack of maintenance
- Potential design variables and the alternative visual impacts they would create
- **Numbers of people who are "receptors" and their perception of what they see**
- Allowing advertising on towers
- Comparative aesthetics of different technologies
- **Sound impacts**

## Interconnection with the Power Grid

- **Different onshore infrastructure requirements for each suggested site**
- **Difficulty in securing easements necessary for onshore transmission, substations, etc. to connect each of the proposed sites**
- **Offshore interconnection infrastructure**
- **Adequacy of existing transmission (generally and in relation to specific sites)**
- Potential for transmission corridors
- Conflicts or synergies with other generation

## Project Economics

- **All-in cost for each of the sites, including interconnection to the grid**
- **Cash flows for each site (life cycle)**
- Administrative costs of public ownership
- **Security costs to protect farms from potential terrorist attacks**
- **Potential for storm damage and associated costs**
- **Risk assessment of alternative sites**
- **Cost variability of alternative sea bottoms and necessary foundations**
- Economic costs of other sources (e.g. externalities)
- Health impacts (and cost of not doing it)
- Economic development / job creation (mfg, installation, O&M)
- Useful life – lease vs. buy decision
- Potential for long term contracts and known rates
- **Creation of new fish habitats and aquaculture**
- Impacts of alternative ownership models
- Impacts of decommissioning requirements
- Opportunity for upgrades to better technology

## Benefits Sharing

- Opportunity for "my town" to invest and own
- **Commitment to supply economically priced power to Block Island**
- Availability of long term power purchase contracts?

# MEETING PRESENTATIONS:
# AUGUST 30, 2007
# OCTOBER 24 AND 31, 2007

Presentations are available separately as PDFs.

**Key Points of the Final Agreement between Delmarva Power and Babcock & Brown**

1. Delmarva Power will buy 200 megawatts of power from the Bluewater wind farm, which can be sized as large as 600 MW. Regardless of the wind farm's final size, Delmarva Power will purchase a proportion of power that will equal the amount generated by a 200 megawatt nameplate facility. Compared to the previous proposal, Delmarva Power's Delaware customers will now buy approximately half of the output they would have otherwise purchased under the contract that was negotiated in December 2007.

2. The overall price per megawatt hour for Delmarva's Delaware customers has also been decreased from the previous proposal, due to a negotiated decrease in the price of renewable energy credits. For instance under the previous proposal, the combined cost for energy and renewable energy credits (RECs) was $121.64 per megawatt hours (in 2008 prices). Due to a negotiated 22 percent reduction in the price Delmarva's Delaware customers will pay for RECs, the combined price under the new agreement is $117.10 per megawatt hour.

3. Delmarva Power and Babcock & Brown will work with the General Assembly to modify the state renewable portfolio standards (RPS) statute to provide that each REC generated by an off-shore wind farm in Delaware receives a 350 percent credit towards meeting the state's RPS requirements. This will allow Delmarva Power to buy fewer RECs for its Delaware customers from the offshore facility and will provide Babcock & Brown with additional RECs to sell in the market. This change will allow Delmarva's Delaware customers to save roughly an additional $100 million over the life of the contract and provides Babcock & Brown with the opportunity to realize additional revenues that are critical to bring the offshore wind farm to fruition.

4. Delmarva Power will work with Babcock & Brown to establish an optional program whereby any Delmarva Power Delaware customer may choose to purchase more of his or her electricity supply from the wind farm. These optional purchases will enable Delmarva Power Delaware customers to provide additional support for efforts to address climate change and to further support the wind farm. Such a program would be subject to Commission approval.

5. Delmarva Power and Babcock & Brown will work with the General Assembly to implement a non-bypassable charge that spreads both the costs and the benefits of the wind farm to Delmarva Power's entire Delaware customer base.

# Definition of Key Terms

## Renewable Energy Credits (RECs)

- Renewable Energy Credits (or Certificates, RECs) are tradable environmental commodities in the United States that represent proof that one (1) megawatt-hour (MWh) of electricity was generated from an eligible renewable energy resource.

- RECs are used to fulfill state clean energy goals and in this way provide an incentive for the development of renewable energy resources.

- The RECs are separated from the other outputs of the wind farm because often times a buyer does not want to take delivery of the actual energy, but does want to support the cost for the development of renewable projects.

## Non-Bypassable Surcharge

- Non-bypassable surcharge is a commonly used utility term that describes a charge to customers on their monthly bills for a public benefit program (such as programs for renewable energy, low income energy assistance, and energy conservation and efficiency).

- Whether customers obtain their electricity supply from the utility or a third-party supplier, they would continue to pay the surcharge since the program the charge supports provides a public good for all customers.

###

RGGI Inc.

Regional Greenhouse Gas Initiative, Inc.
90 Church Street, 4th Floor
New York, New York 10007

FOR IMMEDIATE RELEASE
June 11, 2010

Contact: Emilee Pierce
212-417-3179



# RGGI $CO_2$ Auction Fuels Clean Energy Economy With $80.4 Million in Proceeds

*Current Control Period Allowances Sold at $1.88*
*Future Control Period Allowances Sold at $1.86*

(NEW YORK, NY) – The ten states participating in the Regional Greenhouse Gas Initiative (RGGI), the nation's first mandatory, market-based program to reduce greenhouse gas emissions, today announced the results of the second quarterly auction of carbon dioxide ($CO_2$) allowances in 2010. The auction, held Wednesday, June 9th, yielded $80,465,566.78 for states to invest in the clean energy economy.

40,685,585 $CO_2$ allowances for the first three-year control period (2009-2011) offered in Wednesday's auction sold at a price of $1.88.

In a parallel offering, the RGGI states also auctioned $CO_2$ allowances for the second three-year control period (2012-2014). A total of 2,137,993 $CO_2$ allowances for the second control period sold at a price of $1.86.

"Wednesday's auction continues RGGI's track record of successful implementation," said David Littell, Commissioner of the Maine Department of Environmental Protection and Chair of the RGGI, Inc. Board of Directors. "As we work to advance legislation at the federal level, the RGGI programs continue to be a model for strong national policy, developing best practices for the implementation of cap-and-trade programs."

Proceeds from all the RGGI auctions now total more than $662.8 million. States are investing these proceeds in consumer benefit programs that further reduce emissions, save consumers money and create jobs. Overall, states are investing the vast majority of proceeds to improve energy efficiency and accelerate the deployment of renewable energy technologies.

"Every dollar invested in energy efficiency and renewable energy advances the clean energy economy," said Amey Marrella, Commissioner of the Connecticut Department of Environmental Protection. "RGGI states are putting auction proceeds to work in innovative programs to secure a cleaner environment, save consumers money and put people back to work."

Overall, states are investing roughly 60 percent of the proceeds from RGGI $CO_2$ allowance auctions in energy efficiency, the most cost-effective resource for reducing energy demand in the near-term. Energy efficiency measures, such as building retrofits, heating system replacements and appliance upgrades, save consumers 20 to 30 percent off their energy bills.

While states maximize near-term energy efficiency opportunities, they are also investing in renewable energy sources for a long-term clean energy future. Across the region, funds are being used to install solar, wind and geothermal energy generation systems in commercial and industrial facilities and to deploy solar energy and hot water systems on homes and businesses.

States are beginning to document both the direct consumer benefits and the broad economic gains that the investment of RGGI proceeds is bringing to the region. For example, in Connecticut, electric and gas energy efficiency programs, funded in part with RGGI proceeds, are producing more than $4.00 in benefits for every $1.00 invested. New York is showing a greater than 8 to 1 benefit for every dollar invested in renewable energy systems.

"Expanded efficiency programs, funded in part by RGGI, will generate roughly $6 billion in consumer energy savings in Massachusetts over the next three years," said Phil Giudice, Commissioner of the Massachusetts Department of Energy Resources. "The same programs are also expected to create or maintain nearly 4,000 jobs for contractors, HVAC technicians, architects and other specialists, also over three years."

To learn more about how each state is investing RGGI auction proceeds, please visit: http://www.rggi.org/states/program_investments.

Additional details about RGGI Auction 8 may be found in the *Market Monitor Report for Auction 8*, appended below.

The next RGGI auction is scheduled for September 8, 2010.

**Selected Investment Highlights**
Selected investment highlights from each of the ten RGGI states include the following:

Renewable Energy

- **Connecticut has approved $1.3M** of its RGGI allocation for municipal projects in the **On-Site Distributed Generation Program** – the allocation funds solar PV energy systems on municipal buildings. Between November 2009 and May 2010, 9 projects were approved, 7 on schools and 2 on town buildings. Together, the projects will add 415 kW of clean, renewable power to the grid.

- **Maryland has invested $2.16M** in its RGGI proceeds in its **Solar Energy Grant Program** – a program to provide grants for solar electricity and hot water systems on homes and businesses. Since RGGI began, over 400 grants have been awarded to residents across the state. The grants helped add over 1,700 MWh of clean, renewable solar power to the grid.

- **New Jersey has invested $19.4M** in its **Clean Energy Solutions Capital Investment Loan/Grant Program** – a program to provide zero-interest loans and grants for large-scale renewable energy and energy efficiency projects. Through April 2010, 8 projects have received grants or loans for combined heat and power (CHP) systems, commercial-scale solar electric systems and a feasibility study for an offshore wind turbine installation. The funded CHP and solar-electric systems represent 14 MW of new, clean generation capacity.

Energy Efficiency

- **Maine has invested $3.5M** in its **Industrial Energy Efficiency Grant Program** – a program to provide grants between $100,000 and $1 million for large-scale energy efficiency projects, including CHP systems. In 2009, a total of 16 grants were awarded, 6 of which were funded by RGGI. The 6 RGGI projects will avoid more than 367,560 metric tons of $CO_2$ over their lifetime.

- **New Hampshire has invested $500K** in its **EnergySmart Schools Program** – a program to provide energy benchmarking services to New Hampshire's K-12 schools. Each school will

receive a report which documents energy use, costs and emissions for each building, and provides recommendations for immediate strategies to reduce energy use.

- **Rhode Island has committed $3.95M** to the **Least Cost Procurement Energy Efficiency Utility Account at National Grid** for supplementing and expanding energy efficiency programs, including: home energy audits, Energy Star lighting and appliance rebates, high-efficiency heating, water heating and controls incentives, Energy Star central air conditioning rebates and energy efficiency educational programs.

- **Delaware has invested RGGI proceeds** in the Sustainable Energy Utility's **Energize Delaware Appliance Rebate Program** – a program to provide rebates of up to $200 for the purchase of an Energy Star-qualified clothes washer, dishwasher, room air conditioner, or gas water heater. Since September 2009, the program has provided more than 10,000 rebates, saving consumers nearly $250,000.

- **Vermont has invested RGGI proceeds** in its **Button-Up Vermont Program** – a program to provide free home energy-savings workshops where residents learn how to implement do-it-yourself measures to improve energy efficiency. Participants also learn about saving opportunities associated with energy retrofits, and about technical and financial resources available to them.

Workforce Development

- **New York State committed $8M** to the **Workforce Development Programs** – To meet ambitious legislated goals for improving the energy efficiency of existing homes, New York is devoting substantial resources to greatly expand the workforce training infrastructure needed to prepare workers to design, install, and maintain energy efficiency initiatives. Funds will be used to provide apprenticeship and internship incentives to employers and training institutions, expand existing training centers, fund basic skill initiatives, provide funding for training equipment, and improve field testing process and certification examinations to help increase the number of qualified workers. The funds are projected to significantly increase the number of workers that have been trained over the past few years.

- **Massachusetts has invested $1.9M** in its **Energy Efficiency Skills and Innovation Initiative** – a program to train the state's cutting edge green collar workforce. Under the program, Springfield Technical Community College is serving as a statewide clearinghouse for energy efficiency training activities, materials and services, and is coordinating job training at community colleges across the state.

***About the Regional Greenhouse Gas Initiative***

The 10 Northeast and Mid-Atlantic states participating in RGGI (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Jersey, New Hampshire, New York, Rhode Island and Vermont) have designed and implemented the first market-based, mandatory cap-and-trade program in the U.S. to reduce greenhouse gas emissions. Power sector $CO_2$ emissions are capped at 188 million short tons per year through 2014. The cap will then be reduced by 2.5 percent in each of the four years 2015 through 2018, for a total reduction of 10 percent.

A $CO_2$ allowance represents a limited authorization to emit one short ton of $CO_2$, as issued by a respective participating state. A regulated power plant must hold $CO_2$ allowances equal to its emissions to demonstrate compliance at the end of each three-year control period. The first control period for fossil fuel-fired electric generators under each state's $CO_2$ Budget Trading Program took

effect on January 1, 2009 and extends through December 31, 2011. $CO_2$ allowances for the first control period (2009-2011) may be used to meet current compliance obligations, or may be banked for use in future control periods. $CO_2$ allowances for the second control period (2012-2014) can only be used to meet compliance obligations beginning in 2012. $CO_2$ allowances issued by any participating state are usable across all state programs, so that the ten individual state $CO_2$ Budget Trading Programs, in aggregate, form one regional compliance market for $CO_2$ emissions. For more information turn to: www.rggi.org

***About Regional Greenhouse Gas Initiative, Inc.***
RGGI, Inc. was created to provide technical and administrative services to the states participating in the Regional Greenhouse Gas Initiative. RGGI, Inc. is a 501(c)3 nonprofit organization. For more information please visit: www.rggi.org/rggi

The RGGI auctions are administered by RGGI, Inc. and run on an online platform provided by World Energy Solutions, Inc.

###

RGGI Inc.

# MARKET MONITOR REPORT FOR AUCTION 8

**Prepared for:**

**RGGI, Inc., on behalf of the RGGI Participating States**

**Prepared By:**

POTOMAC ECONOMICS

June 11, 2010

This report was prepared by Potomac Economics (the contractor) in the course of performing work contracted for and sponsored by RGGI, Inc. on behalf of the RGGI Participating States (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont). The opinions expressed in this report do not necessarily reflect those of RGGI, Inc. or any of the Participating States, and reference to any specific product, service, process, or method does not constitute an implied or expressed recommendation or endorsement of it. Further, RGGI, Inc., the Participating States, and the contractor make no warranties or representations, expressed or implied, as to the fitness for particular purpose or merchantability of any product, apparatus, or service, or the usefulness, completeness, or accuracy of any processes, methods, or other information contained, described, disclosed, or referred to in this report. RGGI, Inc., the Participating States, and the contractor make no representation that the use of any product, apparatus, process, method, or other information will not infringe privately owned rights and will assume no liability for any loss, injury, or damage resulting from, or occurring in connection with, the use of information contained, described, disclosed, or referred to in this report.

The Regional Greenhouse Gas Initiative (RGGI) is a cooperative effort by participating states to reduce emissions of carbon dioxide ($CO_2$), a greenhouse gas that causes global warming.

RGGI, Inc. is a non-profit corporation created to provide technical and administrative services to the $CO_2$ Budget Trading Programs of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.

# MARKET MONITOR REPORT FOR AUCTION 8

As the Market Monitor for the RGGI $CO_2$ allowance market, Potomac Economics monitors the conduct of market participants in the auctions and in the secondary market to identify indications of market manipulation or collusion. We also review the administration of the auctions by World Energy Solutions. This report summarizes our findings regarding RGGI Auction 8, which was held on June 9, 2010.

We observed the auction as it occurred and have completed our review and analysis of its results. Based on our review of bids in the auction, we find no material evidence of collusion or manipulation by bidders.

A large number of bidders participated in the 2010 vintage offering with 43 entities submitting bids to purchase 1.3 times the available supply of allowances, resulting in a clearing price of $1.88 per ton. The quantity of allowances for which bids were submitted (over 54 million) decreased from the previous auction. Compliance entities or their affiliates purchased the majority (92 percent) of the allowances in the auction.

A small number of allowances were auctioned for the second control period (with a 2013 vintage year). All of the 2013 vintage allowances were sold, with ten entities submitting bids to purchase 1.2 times the available supply of allowances, resulting in a clearing price of $1.86 per ton. Compliance entities or their affiliates purchased 100 percent of the allowances in the 2013 vintage offering.

Based on our review of the administration of the market, we found that:

- The auction was administered in a fair and transparent manner in accordance with the noticed auction procedures and limitations.
- The auction results were consistent with the market rules and the bids received.
- Sensitive information was treated appropriately by the auction administrator.
- There were no indications of hardware or software problems, communications issues, security breaches, or other problems with the auction platform.

In summary, the results of our monitoring of RGGI Auction 8 raise no material concerns regarding the auction process, barriers to participation in the auction, or the competitiveness of the auction results. The appendix provides additional information about the market for RGGI $CO_2$ allowances and outcomes of the auction.

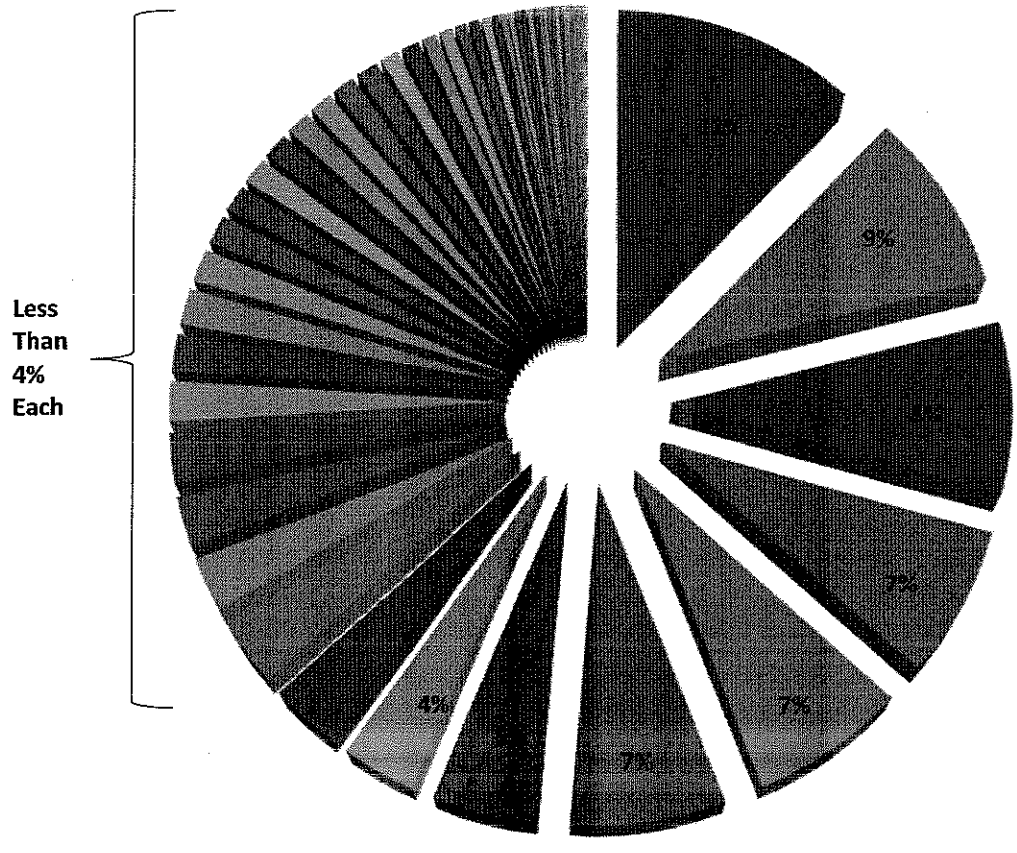
# APPENDIX

## A. DISPERSION OF PROJECTED DEMAND

*The wide dispersion of projected demand for RGGI allowances across compliance entities facilitates the competitive performance of the auction.*

The following figure shows the relative shares of projected demand for RGGI allowances by compliance entity. The largest compliance entity represents only 12 percent of the total projected demand for allowances. Almost half of the projected demand is composed of entities that each account for less than 6 percent of the total demand. Participation by a large number of entities facilitates the competitive performance of the auction.

**Figure 1: Projected Demand for RGGI Allowances**
**Shares by Compliance Entity**



## B. Dispersion of Bids in Auction 8

*In the 2010 vintage offering, bids were submitted by a large number of entities, and the bids were widely dispersed across both compliance entities and non-compliance entities. These are both positive indicators regarding the competitiveness of the auction.*

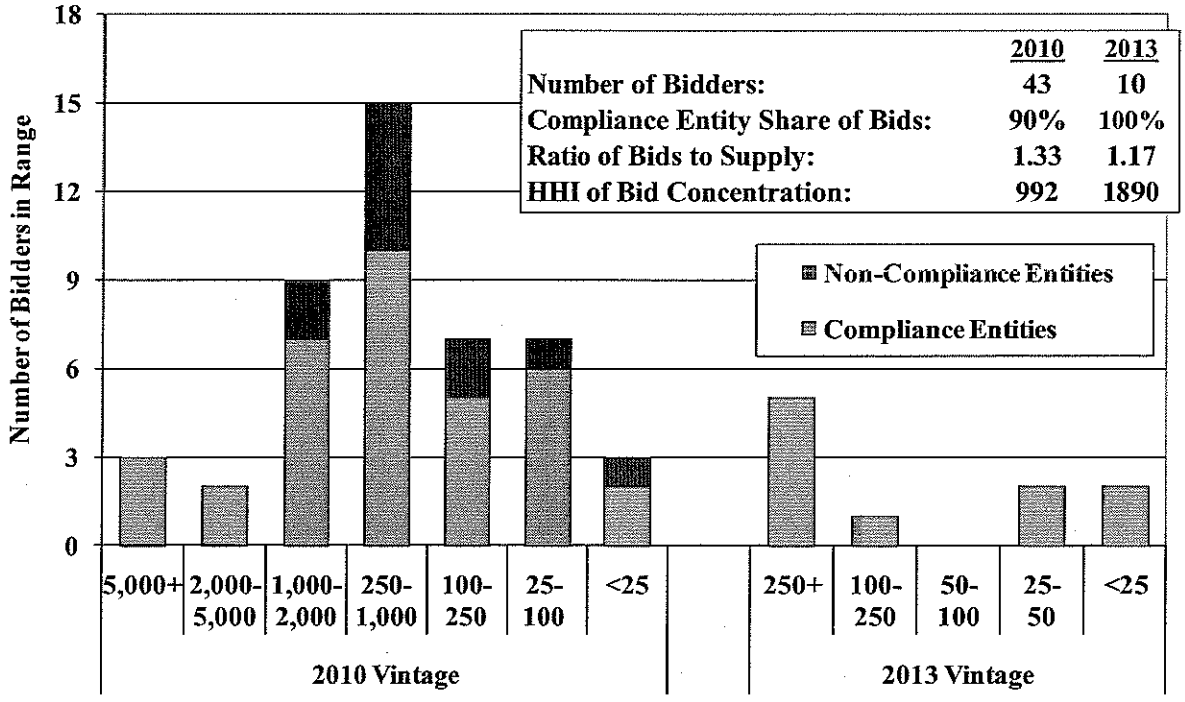
*A small number of allowances were also auctioned in advance for the 2013 vintage year, with ten compliance entities or their affiliates submitting bids. In our review of the bids and the qualification process, we found no material evidence of anti-competitive conduct or significant barriers to participation.*

The following figure summarizes the quantities of allowances for which bids were submitted in the two offerings. In the 2010 vintage offering, all of the bidders that submitted bids for a large quantity of allowances (e.g., at least 2 million tons or 5 percent of the available supply) were compliance entities or their affiliates. Overall, compliance entities accounted for 90 percent of the quantity of allowances for which bids were submitted in the 2010 vintage offering. The quantity of allowances for which bids were submitted decreased from 2.3 times the available supply in Auction 7 to 1.3 times the available supply in Auction 8.

In the 2013 vintage offering, the quantity of allowances for which bids were submitted was 1.2 times the available supply. All of the bids were submitted by compliance entities in the 2013 vintage offering.

The bid quantities were widely distributed among the 43 bidders in the 2010 vintage offering. The concentration of bids, using the Herfindahl-Hirschman Index ("HHI"), was low at 992 in the 2010 vintage offering. Fewer entities submitted bids in the 2013 vintage offering, leading the concentration of bids to be substantially higher (1890). The HHI is a standard measure of concentration calculated by squaring each entity's share and then summing the squares across all entities (hence, the index ranges from 0 to 10,000). In this report, firms that are involved in the management of a budget source may be categorized as compliance entities even if they do not have stock ownership in the source.

**Figure 2: Quantity of Bids Submitted by Entity**
**By Type of Entity and Quantity Bid**



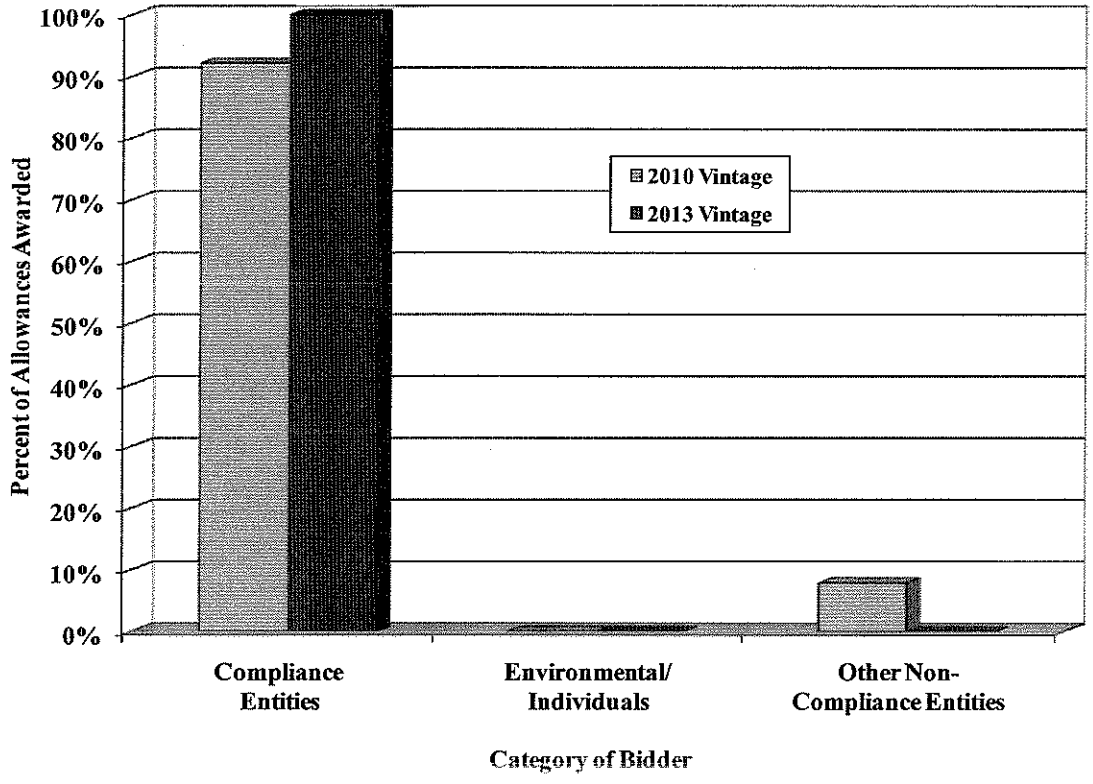
## C. Summary of Purchases of Allowances in Auction 8

*In the 2010 vintage offering, awards were widely distributed across 42 bidders with 5 bidders purchasing two million tons or more, 11 bidders purchasing one million tons or more, and 24 bidders purchasing 250,000 tons or more. In the 2013 vintage offering, awards were distributed across ten bidders with four bidders purchasing 300,000 tons or more.*

The following figure shows the quantity of allowances purchased in the auction by each of three types of entities:

- *Compliance Entities*: This includes all compliance entities and their affiliates.
- *Environmental/Individuals*: This includes non-compliance entities describing themselves as "Environmental Groups" or "Individual Person" in their qualification application.
- *Other Non-Compliance Entities*: This includes all other non-compliance entities.

**Figure 3: Quantity of Allowances Awarded By Type of Entity**



The following table shows the quantity of allowances purchased by each bidder. The identity of each bidder is masked, and the bidders are ranked according to the amount of allowances awarded, from largest to smallest.

**Table 1: Quantity of Allowances Awarded by Bidder**

| Bidder | Number of 2010 Allowances Awarded |
|---|---|
| Bidder 1 | 7,500,000 |
| Bidder 2 | 7,150,000 |
| Bidder 3 | 4,383,585 |
| Bidder 4 | 2,500,000 |
| Bidder 5 | 2,397,000 |
| Bidder 6 | 1,500,000 |
| Bidder 7 | 1,450,000 |
| Bidder 8 | 1,450,000 |
| Bidder 9 | 1,400,000 |
| Bidder 10 | 1,250,000 |
| Bidder 11 | 1,052,000 |
| Bidder 12 | 966,000 |
| Bidder 13 | 800,000 |
| Bidder 14 | 795,000 |
| Bidder 15 | 791,000 |
| Bidder 16 | 630,000 |
| Bidder 17 | 550,000 |
| Bidder 18 | 500,000 |
| Bidder 19 | 500,000 |
| Bidder 20 | 476,000 |
| Bidder 21 | 400,000 |
| Bidder 22 | 370,000 |
| Bidder 23 | 307,000 |
| Bidder 24 | 260,000 |
| Bidder 25 | 240,000 |
| Bidder 26 | 200,000 |
| Bidder 27 | 200,000 |
| Bidder 28 | 175,000 |
| Bidder 29 | 100,000 |
| Bidder 30 | 75,000 |
| Bidder 31 | 61,000 |
| Bidder 32 | 47,000 |
| Bidder 33 | 38,000 |
| Bidder 34 | 32,000 |
| Bidder 35 | 29,000 |
| Bidder 36 | 25,000 |
| Bidder 37 | 24,000 |
| Bidder 38 | 20,000 |
| Bidder 39 | 20,000 |
| Bidder 40 | 15,000 |
| Bidder 41 | 4,000 |
| Bidder 42 | 3,000 |

| Bidder | Number of 2013 Allowances Awarded |
|---|---|
| Bidder 1 | 534,000 |
| Bidder 2 | 534,000 |
| Bidder 3 | 475,000 |
| Bidder 4 | 300,000 |
| Bidder 5 | 177,993 |
| Bidder 6 | 53,000 |
| Bidder 7 | 25,000 |
| Bidder 8 | 25,000 |
| Bidder 9 | 13,000 |
| Bidder 10 | 1,000 |

## D. Summary of Bid Prices in Auction 8

*The distribution of bid prices submitted in the auction indicates that the demand for allowances was relatively elastic, which is a signal that the results were competitive.*

The following table reports several statistics regarding the bid prices for bids submitted in Auction 8. The median and mean bid prices are weighted by the quantity of each bid.

| | 2010 | 2013 |
|---|---|---|
| **Bid Prices:** | | |
| **Minimum** | **$1.86** | **$1.86** |
| **Maximum** | **$4.00** | **$2.02** |
| **Average (Median)** | **$2.00** | **$1.89** |
| **Average (Mean)** | **$2.01** | **$1.89** |
| **Clearing Prices:** | **$1.88** | **$1.86** |

## E. Names of Potential Bidders in Auction 8

In accordance with Section 2.8 of the Auction Notice for $CO_2$ Allowance Auction 8 on June 9, 2010, the Participating States are releasing the names of Potential Bidders in Auction 8. The states defined potential bidders as: "Each Applicant that has been qualified and submitted a complete *Intent to Bid*." The list of 53 Potential Bidders is as follows:

AES Eastern Energy, LP
Aircraft Services Corporation
ANP Funding I, LLC
Astoria Generating Company, LP
Barclays Bank PLC
Boston Generating, LLC
Brick Power Holding, LLC
Bridgeport Energy, LLC
Brooklyn Navy Yard Cogen Partners, LP
Caithness Long Island, LLC
Calpine Energy Services, LP
Castleton Power, LLC
Conectiv Energy Supply, Inc.
Conn. Municipal Electric Energy Coop.
ConocoPhillips Company
Consolidated Edison Comp. of NY, Inc.
Constellation Energy Commodities Group
CP Energy Marketing (US) Inc.
Delaware Municipal Electric Corp.
Dominion Energy Marketing, Inc.
DTE Carbon, LLC
Dynegy Marketing and Trade, LLC
E.ON Energy Trading SE
GDF SUEZ Energy Marketing NA, Inc.
H.Q. Energy Services (US) Inc.
Hess Corporation (G)
J-Power USA Development Co., Ltd.
Lake Road Generating Company, L.P
Louis Dreyfus Energy Services, LP
Macquarie Energy, LLC
Massachusetts Muni. Wholesale Elec. Co.
Merrill Lynch Commodities, Inc.
Millennium Power Partners, LP
Mirant Energy Trading, LLC
Morgan Stanley Capital Group, Inc.
National Grid Gen. dba National Grid
New Athens Generating Company, LLC
NextEra Energy Power Marketing, LLC
North American Energy Alliance, LLC
NRG Power Marketing, LLC
Old Dominion Electric Cooperative
Power Authority of the State of New York
PPL EnergyPlus, LLC
PSEG Energy Resources & Trade, LLC
Public Service Company of New Hampshire
RBC
Rochester Gas and Electric Corporation
Selkirk Cogen Partners, LP
TAQA Gen X, LLC
TransCanada Power Marketing, Ltd.
Verso Paper Corp.
Village of Freeport
Vitol Inc.

**Cost impact for TPA for 20 years**

**Energy and LDC 3.5% escalation**

($)

| Year | Energy | LDC | Total |
|---|---|---|---|
| 1 | 173,810 | 113,190 | 287,000 |
| 2 | 179,893 | 117,152 | 297,045 |
| 3 | 186,189 | 121,252 | 307,442 |
| 4 | 192,706 | 125,496 | 318,202 |
| 5 | 199,451 | 129,888 | 329,339 |
| 6 | 206,431 | 134,434 | 340,866 |
| 7 | 213,657 | 139,140 | 352,796 |
| 8 | 221,135 | 144,010 | 365,144 |
| 9 | 228,874 | 149,050 | 377,924 |
| 10 | 236,885 | 154,267 | 391,152 |
| 11 | 245,176 | 159,666 | 404,842 |
| 12 | 253,757 | 165,254 | 419,011 |
| 13 | 262,639 | 171,038 | 433,677 |
| 14 | 271,831 | 177,025 | 448,855 |
| 15 | 281,345 | 183,220 | 464,565 |
| 16 | 291,192 | 189,633 | 480,825 |
| 17 | 301,384 | 196,270 | 497,654 |
| 18 | 311,932 | 203,140 | 515,072 |
| 19 | 322,850 | 210,250 | 533,099 |
| 20 | 334,150 | 217,608 | 551,758 |
| | 4,915,285 | 3,200,983 | **8,116,269** |

**Only energy 3.5% escalation**

($)

| Energy | LDC | Total |
|---|---|---|
| 173,810 | 113,190 | 287,000 |
| 179,893 | 113,190 | 293,083 |
| 186,189 | 113,190 | 299,380 |
| 192,706 | 113,190 | 305,896 |
| 199,451 | 113,190 | 312,641 |
| 206,431 | 113,190 | 319,622 |
| 213,657 | 113,190 | 326,847 |
| 221,135 | 113,190 | 334,325 |
| 228,874 | 113,190 | 342,065 |
| 236,885 | 113,190 | 350,075 |
| 245,176 | 113,190 | 358,366 |
| 253,757 | 113,190 | 366,947 |
| 262,639 | 113,190 | 375,829 |
| 271,831 | 113,190 | 385,021 |
| 281,345 | 113,190 | 394,535 |
| 291,192 | 113,190 | 404,382 |
| 301,384 | 113,190 | 414,574 |
| 311,932 | 113,190 | 425,122 |
| 322,850 | 113,190 | 436,040 |
| 334,150 | 113,190 | 447,340 |
| 4,915,285 | 2,263,804 | **7,179,090** |

**Above Market Cost effect by Phase 2 (385MW)**

| | | | | | |
|---|---|---|---|---|---|
| a | DW demonstration project | 100,915 | MWh/y | Docket 4111 data | |
| b | Phase 2 MW | 385 | MW | | |
| c | Phase 2 MWh/y | 1,349,040 | MWh/y | | b*365*24*0.4 |
| | | | | | |
| d | Above market cost at 24.4c/kwh | 12,377,137 | $/2013 | Docket 4111 data | |
| | | | | | |
| e | Above market cost at 22.5c/kwh | 139,826,823 | $/first year | | d*c/a-(0.244-0.225)*c*1000 |
| | | | | | |
| f | Whole kwh NG is selling | 8,106,768,760 | kwh | Docket 4111 data | |
| | | | | | |
| | **Potential above maeket cost for big projeot** | **0.0172** | **$/kwh** | | e/f |

Above Market Cost Affect by Phase 2 (385MW)

| Price (c/kwh) | 22.5 | 20 | 18 | 16 |
|---|---|---|---|---|
| | | | | |
| Potential above market cost for Phase 2 at first year ($/kwh) | 0.0172 | 0.0164 | 0.0131 | 0.0098 |
| | | | | |
| Impact for TPA for first year ($) | 1,897,297 | 1,805,772 | 1,439,672 | 995,494 |
| Impact for TPA for 20 years at 3.5% escalation ($) | 53,654,964 | 51,066,666 | 40,713,475 | 28,152,263 |

# Forward Capacity Market (FCA 2012-2013) Result Report

This report is intended to provide a summary of the results for the third Forward Capacity Auction for Capacity Commitment Period of June 1, 2012 to May 31, 2013 (FCA_2012_2013). FCA_2012_2013 concluded upon reaching the Lower Bound of the Capacity Clearing Price Collar ($2.951 or 0.6 X CONE), meaning, the amount of capacity offered in the auction exceeded the amount needed to meet the Net Installed Capacity Requirement for the commitment period. The results of the auction are contained in two sections, Auction Round Results and Capacity Supply Obligation Details. An explanation for the data is provided within the appropriate section of this document.

Each of the values is calculated in accordance with Market Rule 1 Sections III.12. Calculation of Capacity Requirements and III. 13. Forward Capacity Market. The details concerning the calculations for any of the auction values contained in the tables below can be found in Market Rule 1 Section III.13.2 Annual Forward Capacity Auction and/or The User Guide for Forward Capacity Auction 2012-2013. Both documents are available on the ISO New England website.

## Section 1:

**Auction Round Results-** FCA_2012_2013 began at 9:00 AM EST on October 5, 2009 and concluded after seven rounds at 1:30 PM on October 6, 2009. The tables listed below contain specific MW and dollar amounts for each round of the auction. The data is contained in two tables (Maine and Rest of Pool) and includes the following information:

- The Net Installed Capacity Requirement (NICR) for the commitment period (31,965MW)
- The start price and end price for each of the seven rounds specific to the each of the Capacity Zones in dollars per kW Month.
- The excess MW amount for each Capacity Zone at the end of each round
- The excess MW amount if above the available capacity limit on the External Tie lines connected to each Capacity Zone or a text identifying there is "No Excess Supply" if the amount available was less than or equal to the available capacity limit on the tie line.
- A Note at the bottom of the document contains clarification information.

# Forward Capacity Market (FCA 2012-2013) Result Report

## Capacity Clearing Price Lower Bound Collar Reached ($2.951/kW/Month)

## Maine:

| Round | System-Wide (NICR: 31,965.000 MW) | Capacity Zone Maine (MCL: 3,257.000 MW) | External Interface New Brunswick |
|---|---|---|---|
| Status | | Closed Capacity Clearing Price Collar Reached | Closed Capacity Clearing Price Collar Reached |
| Round 1 | $ 9.836 – $ 6.000 | $ 9.836 – $ 6.000 | $ 9.836 – $ 6.000 |
| *Excess* | 5,553.455 MW | 690.212 MW | No Excess Supply |
| Round 2 | $ 6.000 – $ 5.000 | $ 6.000 – $ 5.000 | $ 6.000 – $ 5.000 |
| *Excess* | 5,453.447 MW | 690.212 MW | No Excess Supply |
| Round 3 | $ 5.000 – $ 4.400 | $ 5.000 – $ 4.400 | $ 5.000 – $ 4.400 |
| *Excess* | 5,392.626 MW | 690.212 MW | No Excess Supply |
| Round 4 | $ 4.400 – $ 3.934 | $ 4.400 – $ 3.934 | $ 4.400 – $ 3.934 |
| *Excess* | 5,345.398 MW | 690.212 MW | No Excess Supply |
| Round 5 | $ 3.934 – $ 3.689 | $ 3.934 – $ 3.689 | $ 3.934 – $ 3.689 |
| *Excess* | 4,738.799 MW | 654.263 MW | No Excess Supply |
| Round 6 | $ 3.689 – $ 3.320 | $ 3.689 – $ 3.320 | $ 3.689 – $ 3.320 |
| *Excess* | 4,697.655 MW | 648.273 MW | No Excess Supply |
| Round 7 | $ 3.320 – $ 2.951 | $ 3.320 – $ 2.951 | $ 3.320 – $ 2.951 |
| *Excess* | 4,648.834 MW | 641.263 MW | No Excess Supply |

NOTE:

- All prices are in $/KW-Month
- NICR = Net Installed Capacity Requirement
- MCL = Maximum Capacity Limit
- Type of Capacity Zone: Export-Constrained
- An External Interface cannot close earlier than the associated Capacity Zone
- Excess Supply (system-wide and in Export-Constrained Capacity Zone) has not been adjusted for **excess** of Real Time Emergency Generation capacity

# Forward Capacity Market (FCA 2012-2013) Result Report

## Capacity Clearing Price Lower Bound Collar Reached ($2.951/kW/Month)

## Rest of Pool:

| Round | System-Wide (NICR: 31,965.000 MW) | Capacity Zone: Rest-of-Pool | External Interface: New York Cross Sound Cable | External Interface: New York AC Ties | External Interface: Phase I/II HQ Excess | External Interface: Hydro-Quebec Highgate |
|---|---|---|---|---|---|---|
| Status | | Closed: Capacity Clearing Price Collar Reached | Closed: Capacity Clearing Price Collar Reached | Closed: Capacity Clearing Price Collar Reached | Closed: Capacity Clearing Price Collar Reached | Closed: Capacity Clearing Price Collar Reached |
| Round 1 | $ 9.836 – $ 6.000 | | $ 9.836 – $ 6.000 | $ 9.836 – $ 6.000 | $ 9.836 – $ 6.000 | $ 9.836 – $ 6.000 |
| *Excess* | 5,553.458 MW | | No Excess Supply | 465.100 MW | 1,105.330 MW | No Excess Supply |
| Round 2 | $ 6.000 – $ 5.000 | | $ 6.000 – $ 5.000 | $ 6.000 – $ 5.000 | $ 6.000 – $ 6.000 | $ 6.000 – $ 5.000 |
| *Excess* | 5,453.447 MW | | No Excess Supply | 465.100 MW | 1,105.330 MW | No Excess Supply |
| Round 3 | $ 5.000 – $ 4.400 | | $ 5.000 – $ 4.400 | $ 5.000 – $ 4.400 | $ 5.000 – $ 4.400 | $ 5.000 – $ 4.400 |
| *Excess* | 5,322.828 MW | | No Excess Supply | 465.100 MW | 1,105.330 MW | No Excess Supply |
| Round 4 | $ 4.400 – $ 3.934 | | $ 4.400 – $ 3.934 | $ 4.400 – $ 3.934 | $ 4.400 – $ 3.934 | $ 4.400 – $ 3.934 |
| *Excess* | 5,245.388 MW | | No Excess Supply | 465.100 MW | 1,105.330 MW | No Excess Supply |
| Round 5 | $ 3.934 – $ 3.689 | | $ 3.934 – $ 3.689 | $ 3.934 – $ 3.689 | $ 3.934 – $ 3.689 | $ 3.934 – $ 3.689 |
| *Excess* | 4,738.799 MW | | No Excess Supply | No Excess Supply | 1,105.330 MW | No Excess Supply |
| Round 6 | $ 3.689 – $ 3.320 | | $ 3.689 – $ 3.320 | $ 3.689 – $ 3.320 | $ 3.689 – $ 3.320 | $ 3.689 – $ 3.320 |
| *Excess* | 4,697.655 MW | | No Excess Supply | No Excess Supply | 1,105.330 MW | No Excess Supply |
| Round 7 | $ 3.320 – $ 2.951 | | $ 3.320 – $ 2.951 | $ 3.320 – $ 2.951 | $ 3.320 – $ 2.951 | $ 3.320 – $ 2.951 |
| *Excess* | 4,648.634 MW | | No Excess Supply | No Excess Supply | 1,105.330 MW | No Excess Supply |

NOTE:

- All prices are in $/KW-Month
- NICR = Net Installed Capacity Requirement
- An External Interface cannot close earlier than the associated Capacity Zone
- Excess Supply (system-wide and in Export-Constrained Capacity Zone) has not been adjusted for **excess** of Real Time Emergency Generation capacity

# Forward Capacity Market (FCA 2012-2013) Result Report

Section 2:

**Capacity Supply Obligation Details –**

Capacity Supply Obligation totals for FCA_2012_2013 are provided in the tables below. Table 1 contains the system wide totals (including Real-Time Emergency Generation and Self-Supply Values) and Table 2 contains the totals for each Capacity Zone.

**Table 1**

| | Control Area Information | | | | Capacity Supply Obligation Details | | | |
|---|---|---|---|---|---|---|---|---|
| Commitment Period | Installed Capacity Requirement | HQICC | Net Installed Capacity Requirement | Capacity Supply Obligation | RTEG Capacity Supply Obligation | RTEG Utilization Ratio | Self-Supply Obligation | Import Capacity Supply Obligation |
| Date | MW | MW | MW | MW | MW | Number | MW | MW |
| 6/1/2012 | 32879.000 | 914.000 | 31965.000 | 36995.602 | 630.297 | 0.9519322 | 1934.884 | 1900.000 |

**Table 2**

| Capacity Zone Information | | | | | Capacity Supply Obligation Details | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Modeled Capacity Zone ID | Modeled Capacity Zone Name | Modeled Capacity Zone Type | Local Sourcing Requirement | Maximum Capacity Limit | Capacity Supply Obligation | RTEG Capacity Supply Obligation | Self-Supply Obligation | Administrative Pricing | Capacity Clearing Price | Payment Rate | RTEG Payment Rate |
| Number | String | String | MW | MW | MW | MW | MW | String | $/kW-Month | $/kW-Month | $/kW-Month |
| 8500 | Rest-of-Pool | Rest of Pool | | | 33090.959 | 596.799 | 1925.935 | CCP Collar - Floor | 2.951 | 2.536 | 2.413 |
| 8503 | Maine | Export | | 3257.000 | 3896.643 | 33.498 | 8.949 | CCP Collar - Floor | 2.951 | 2.465 | 2.347 |